WAYSIDE & WOODLAND BLOSSOMS

A GUIDE TO BRITISH WILD FLOWERS

BY
EDWARD STEP

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WAYSIDE AND WOODLAND BLOSSOMS

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1 *Pl.* 1. **Common Red Poppy.** (p. 47.) *Frontispiece.*
Papaver rhœas. PAPAVERACEÆ.

Wayside and Woodland Blossoms

A POCKET GUIDE TO BRITISH WILD-FLOWERS
FOR THE COUNTRY RAMBLER

(FIRST SERIES)

WITH CLEAR DESCRIPTIONS OF 394 SPECIES

BY

EDWARD STEP, F.L.S.

AUTHOR OF
"WAYSIDE AND WOODLAND TREES," "WAYSIDE AND WOODLAND FERNS," ETC.

WITH

COLOURED FIGURES OF 127 SPECIES
AND 150 TEXT ILLUSTRATIONS
INCLUDING
A PICTORIAL COLOUR KEY TO THE PLATES

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AND NEW YORK

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PREFACE

THE purpose of this work is to assist a very large and increasing class of persons who possess a strong love of flowers, but to whom the ordinary " Floras "—indispensable as they are to the scientific botanist—are as books written in an unknown tongue. With the enormous increase of our town populations, and the greater facilities for home travel, there has grown up a truer appreciation of the country and of all that is beautiful in nature ; and it is hoped that this work may be of service to those who thus steal back to the arms of their Mother, but have not time or inclination to spell out and painfully translate the carefully-made terms of the exact descriptions which learned men have written for the use of the scientific student. Such terms are absolutely necessary, for the things they describe were unknown to our Celtic and Saxon forefathers, who would otherwise have left us names for them which would now be familiar words to all. In a work intended for the identification of plants these technical terms could not be entirely avoided, but they have been used sparingly, and in a manner that will not involve continual reference to a scientific dictionary.

The Author's aim has been to write a book that, whilst it satisfies the rambler who merely wishes to identify the flowers by his path, may also serve as a stepping-stone to the floras of Hooker, Bentham, and Babington ; so that should the interest of any reader be sufficiently awakened he may take up the more serious study of either of these authors without

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having to unlearn what this modest pocket-book may have taught him. At the same time he will here find information on many points of great interest, such as are rarely, if ever, noticed in the "Floras."

The desire to produce the work at a price permitting its general use necessitates an economical arrangement of the plates for printing, and this in turn affects the order in which both plates and letter-press appear in the volume. In truth, there is no order beyond this, that Series I. contains representatives of the plant families or natural orders from the Buttercups to the Composites, inclusive; and Series II. from the Composites to Sedges and Grasses; whilst the new Third Series has species omitted from this sequence, and is largely concerned with a complete account of all the British Orchids.

Each series is therefore complete in itself, and the "Family Characters" at the end of each volume will show the botanical position of any species described, and its comparative relationship to others. The Author has tried to so use the 127 plants delineated that they may serve as a key to a much greater number of species, by indicating briefly the details in which they differ from plants nearly related.

The illustrations in this work as presented in former editions have been replaced in this New Edition by means of a more modern method of reproduction which yields better impressions with more reliable colour effects.

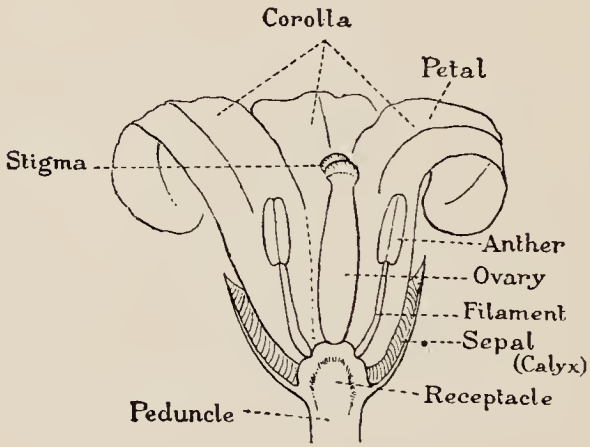
Another new feature is the pictorial colour-key, in which reduced copies of the plates are grouped according to the predominant tints of the flowers. Some aid of this kind has been suggested by users of the earlier editions, as a guide in the identification of plants illustrated in this volume.

INTRODUCTION.

AMONG the many flattering reviews with which the first edition of this work was greeted by the Press, several valuable suggestions were made by the writers on the assumption that a second edition would soon be called for. This prediction was rapidly fulfilled, and we endeavoured to express our gratitude by availing ourselves of the advice given. We purposely avoided anything that would give a scientific or pretentious aspect to the work, and the few technical terms we were bound to employ we explained on the occasion of first using each. Some of our friends, however, have felt a difficulty when such terms were used a second time, in turning back to the precise pages where they had been explained. In later editions, therefore, we attempted by means of a few simple diagrams, and equally simple definitions, to get over this difficulty.

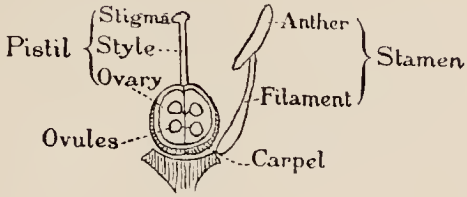
Our first diagram shows an imaginary flower. Commencing from the flower-stalk (*peduncle*), whose enlarged fleshy head is known as the *receptacle*, we have the first series of floral organs, the *sepals*, known collectively as the *calyx*, just as the succeeding series, the *petals*, form the *corolla*. Sometimes all the *sepals* or all the *petals* are joined at their edges to form a tube or a cup, but usually in those cases their number is indicated by the lobes on the free margin. The sepals are usually green, but occasionally there is nothing either of colour or form to

distinguish them from the petals, as in the Lilies, when the double series is spoken of collectively as the *perianth*. Within the corolla we have a series of very dissimilar organs, the *stamens*, and within these the *pistil*. In some flowers stamens or pistil may be entirely absent; in such a case, if there are no stamens, the flower will be described as *pistillate*; if there is no pistil it will be called *staminate*. The stamen consists of two portions, the *filament* or stalk, and the *anther*, or pollen sac. *Pollen* is the mealy powder—the male element—by con-

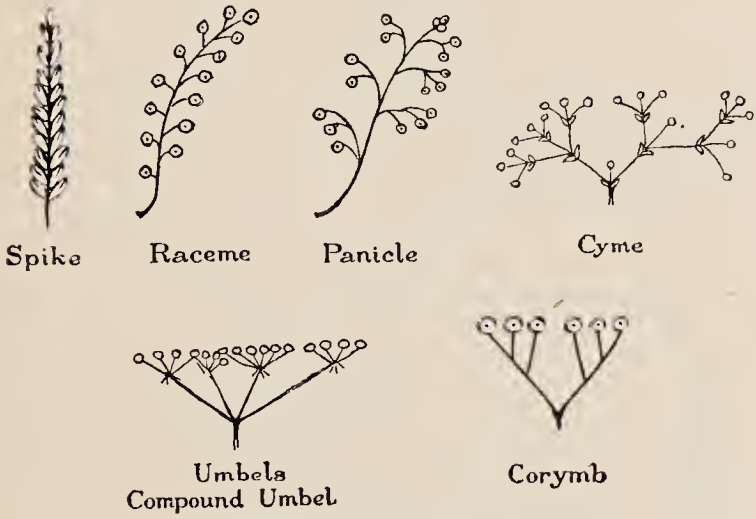


tact with which the *ovules* are fertilized. These ovules are contained in the lower portion of the central or female organ. This—the *pistil*—consists of three portions, the enlarged base or *ovary* composed of one or more *carpels*, and containing one or more ovules; the slender *style*, which is often absent; and its more or less viscid or hairy summit, the *stigma*. It is the stigmatic surface alone that excites the pollen grain to action and causes it to pierce through both stigma and style (where present) and enter the ovary. The stigma may be divided into

two, three, or more lobes, which correspond with the number of carpels of which the ovary is composed.



Our second diagram shows these several portions of each, and may be readily referred to from time to time instead of reading the foregoing description.



Chief forms of flower clusters.

We now attempt by equally simple means to give the clue

to the principal plans upon which flowers are arranged (*inflorescence*) upon the growing plant. If a naked flower-stalk springs directly from the root, and not from a leafy stem, it is said to be a *scape*. Should it be a mere continuation of a leafy branch, the flower-stalk is a *peduncle;* but should it instead of bearing one flower support several, each on its own little foot-stalk (*pedicel*), the main stalk becomes a *rachis*. If the *rachis* bears a number of flowers which are minus these pedicels they are said to be *sessile*, or sitting, and the inflorescence is a *spike;* but if all the flowers have pedicels and are arranged after the manner of the spike, the inflorescence is then a *raceme*. When these pedicels are branched and support two or more flowers on each, so as to give a light loose aspect to the cluster, it is known as a *panicle*. Should the pedicels be of varying lengths and so arranged that all the blossoms in a cluster are brought pretty much to the same level, as in May-blossom, the arrangement is a *corymb*. When a similarly flat-topped cluster has its pedicels of pretty equal length, all radiating from a common point, like the inner ribs of an umbrella, it becomes an *umbel*. A number of small umbels are commonly associated in a precisely similar fashion, forming a *compound umbel*. Another frequent form of inflorescence is the *cyme*, in which a shoot terminates in a flower, and can therefore go no further ; but it sends off side branches, each of which, however, comes to a full stop in a like manner, though growth continues by means of the side shoots. The Daisy, the Dandelion, or any other of the composite order of flowers will afford us yet another type of inflorescence in which a vast number of tiny flowers (*florets*) are packed together on a common platform : this kind is known as a *capitulum* or flower-head. (*See* page 120.)

Having so fully, though briefly, dealt with the ordinary structure and natural grouping of flowers, it may be more convenient to the reader to deal in alphabetical order with the remaining technicalities used in the following pages.

Achene.—A fruit like a little nut, consisting of a carpel containing a single seed.

Axil.—The angle between a stem and the upper side of a leaf-stalk.

Axillary.—Formed in or growing from an axil.

Bipinnate.—In which pinnæ (*see* below) are themselves pinnate.

Bract.—A modified or reduced leaf below the flower.

Bract.

Bracteole.—A diminutive bract.

Cauline leaves.—Leaves that arise from a stem, as contrasted with *radical* leaves, which spring direct from the rootstock.

Cleistogamic.—Flowers devoid of a corolla, and whose sepals never open, but which develop into fruits, nevertheless, as the result of self-fertilization.

Dimorphic.—Used of flowers that appear in *two forms*, such as the Primrose, in which one form has a short style with anthers near the mouth of the corolla-tube, and the other form has a long style and anthers midway down the tube.

Genus.—An assemblage of species which all agree in *one* important though minor structural character, and all bear the same primary name. Plural, *genera.*

Hypogynous.—When petals or stamens spring from beneath the base of the ovary, and are not attached to the calyx.

Inferior.—Used to denote that the calyx or corolla is free from and below the ovary.

Inflorescence.—The arrangement or grouping of the flowers on a plant.

Involucre.—A series of bract-like leaves below a cluster of flowers; or sometimes below a single flower, as in Anemone.

Involucre.

Loculicidal.—When the fruit splits down the middle of back of carpel.

Order.—A group of *genera*, all of which agree in some striking

particular; such as *Cruciferæ*, in which there are twenty-five British genera and about seventy species, all agreeing in the possession of four petals arranged *cross-wise*.

Pinnate Leaf.

Pericarp.—A seed vessel, including the adhering calyx if present.

Phyllaries.—The bracts or scales that form the involucre to a head of Composite flowers.

Pinnate.—When the leaf is broken up into four or more distinct leaflets, arranged in two series along the midrib, as the leaf of Lady's-smock. Each leaflet is called a *pinna;* plural, *pinnæ*.

Pinnatifid.—When the leaf is deeply cut into lobes, but not into separate leaflets. Example, Dandelion.

Radical.—A *radical* leaf is one that arises directly from the root-stock, not from a stem or branch.

Septicidal.—When the fruit splits through the centre of each of its internal divisions.

Spadix.—An inflorescence where the flowers are arranged around a thick fleshy spike. Example, Cuckoo-pint.

Spathe.—The large bract that envelops certain flowers before opening. Examples, the hood of the Cuckoo-pint; the papery wrapper from which the Daffodil and Snowdrop buds emerge.

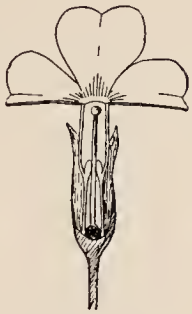
Species.—Individuals that bear almost absolute likeness one to another, varying only to a slight extent, possibly in colour and stature. A sub-species is a variety exhibiting differences almost as great as those separating species.

Stipules.—Small leaves, always in pairs, at the base of the leaf-stalk in many plants. They serve to protect the young leaf in the bud, when they are relatively much larger.

Superior.—Used of the ovary to denote that it is above the attachment of the calyx; of the calyx, to denote that it

adheres to the ovary and will become a part of the future fruit, as in apple and rose.

Stipules.



Superior Ovary.

Versatile.—When the anther is connected to the filament by the centre of its back, so that it swings freely, as if balanced on a pivot.

A PICTORIAL COLOUR KEY TO THE PLATES INCLUDED IN THIS VOLUME.

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Pl. 17. Jack-by-the-Hedge

Pl. 18. Field Penny Cress

Pl. 20. Greater Stitchwort

Pl. 25. Shepherd's Purse

Pl. 26. Bladder Campion

Pl. 31. Mouse-ear Chickweed

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Pl. 35. Corn Spurrey

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Pl. 90. Round-leaved Sundew

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Pl. 49. Barren Strawberry

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Pl. 82. Wild Celery

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Pl. 68. Hog-weed

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SHADES OF PINK

Pl. 69. Crab Apple

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SHADES OF PINK

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Pl. 23. Sandwort Spurrey

Pl. 24. Ragged Robin

Pl. 15. Maiden Pink

Pl. 19. Red Campion

Pl. 104 Spur Valerian

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Pl. 1. Common Red Poppy

Pl. 62 Sainfoin

Pl. 92. Lady's Bedstraw

Pl. 97. Biting Stonecrop

Pl. 40. Needle-whin

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Pl. 28. Rock-rose

Pl. 66. Golden Saxifrage

Pl. 43. Perforated St. John's Wort

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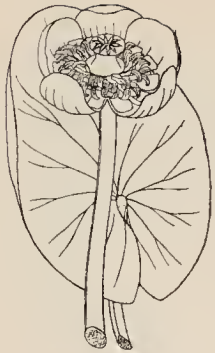
Pl. 21. Woad

Pl. 112 Ploughman's Spikenard

Pl. 4. Lesser Celandine

Pl. 11. Marsh Marigold

Pl. 117. Coltsfoot



Pl. 30. Yellow Water-lily

Pl. 73 Hare's-ear

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Pl. 122 Nipplewort

Pl. 121. Carline Thistle

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Pl. 120. Dandelion

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Pl. 56. Hop Trefoil

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Pl. 52. Wood Avens

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Pl. 118. Chicory

Pl. 107. Field Scabious

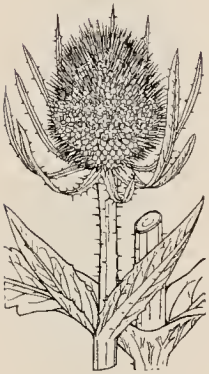
Pl. 76. Tufted Vetch

Pl 27. Columbine

Pl. 46 Corn Cockle

Pl. 123. Blue Fleabane

Pl. 93. Purple Loosestrife



Pl. 116. Teasel

Pl. 42. Wild Pansy

Pl. 53. Common Mallow

Pl. 127. Spear Plume Thistle

Pl. 125. Hard-heads

Pl. 114. Hemp Agrimony

Pl. 85. Lucerne

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Pl. 6. Fumitory

Pl. 98. Ivy

Pl. 89 Moschatel

Pl. 88 Water Milfoil

Pl 16 Setterwort

WAYSIDE AND WOODLAND BLOSSOMS.

Wood Anemone or Windflower (*Anemone nemorosa*).

One of the earliest of spring-flowers to greet us in the copse, by the woodside, and in upland meadows is this bright-faced flower. Its firm, fleshy, almost woody rootstock creeps just below the surface of the mossy soil, and rapidly sends up its stems with folded leaves and drooping buds, after one or two genial days.

The Anemone has only one series of floral leaves, and although these are brightly coloured like petals, botanists regard them as sepals. They are white, delicately tinged with pink inside, and on the exterior they are more or less marked with purple. Occasionally one may come upon a colony of Anemones whose flowers are distinctly purple within and without. These flowers are 1½ inch across, and are borne singly upon a stalk or scape about 6 inches high—so hung that they turn their backs to the slightest breeze. It was evidently this fact that caused the ancients to name the plant Anemone or Windflower, from *anemos*, the Greek word for the wind. Richard Jefferies, curiously ignoring the meaning of the name, entitled one of his word-paintings "Wind-Anemones." One of our poets, improving the connection between the flower and the wind, speaks of "the coy Anemone

that ne'er uncloses her lips until they're breathed on by the wind."

The sepals in this flower may be any number from four to nine; normally there should be five, but most frequently there are six. In the centre is a head of green pistils, each with its short, straight style, and these are surrounded by a ring of stamens. Both stamens and pistils mature together, so that self-fertilization must be frequent; but the visits of many insects must also bring about much cross-fertilization. These insect-visitors are attracted by a delicate fragrance, but there is no honey for them when they arrive, and they have to be content with sucking the juices of the sepals. The flowering period extends from late in March till early in June, and the head of fruits that succeeds the flower consists of little nut-like bodies known as *achenes*, each containing a single seed.

About halfway up the flower-stalk there are three wedge-shaped leaves given off. They are not ordinary leaves, but *involucral* leaves with special functions. When at the first breath of spring the Anemone sends up its flowering stems these are curved over, and the bud that nestles at the summit is protected by the folding of these involucral leaves. The bud lengthens its own stalk and rises above the *involucre*, whose three leaves spread out. The ordinary leaves of the plant are very similar, but they are produced at a little distance from the flower-stalks, and are divided into three much cut and toothed leaflets. These proper leaves do not arise until the flowers have expanded.

There is only one other British species of Anemone—the Pasque flower (*Anemone pulsatilla*). This differs greatly in appearance from the Wood Anemone. It has a stouter root-stock, the divisions of the leaves are very slender, and the dull purple flowers do not spread their sepals out. Both flowers and leaves are clothed in abundant silky hairs. The nutlets composing the fruit-head end in long feathered awns—the developed

1 *Pl.* 2. **Wood Anemone.** (p. 1.) *C* 2.

Anemone nemorosa. RANUNCULACEÆ.

1 *Pl.* 3. **Buttercup.** (p. 3.) *C* 3.

Ranunculus bulbosus. RANUNCULACEÆ.

pistils—with whose aid, when ripe, they are carried away by the wind. The leaves are produced in a rosette around the flower-stem, and do not properly unfold until the flower has passed. Some of the stamens have their ordinary course of development arrested and become nectaries, providing honey for the numerous insects—butterflies, two-winged flies, and beetles—that visit the flower and assist in its pollination. The flowers appear in May and June, but though the plant is locally abundant on chalk downs and limestone pastures, its British range is restricted to the country lying between Norfolk, Essex, and Gloucestershire to York.

The Blue Anemone (*Anemone apennina*) has long been naturalized in a few places, but is not a native. It has a greenish-black *tuberous* rootstock, and its ten to twelve sepals are coloured a bright sky-blue within; paler without.

The Yellow Anemone (*A. ranunculoides*), which may also be encountered occasionally in plantations, is also an alien species. Its yellow flowers serve to distinguish it without other details.

Buttercup (*Ranunculus bulbosus*).

There are three perennial species of *Ranunculus* to which the name of Buttercup is applied impartially; but the one to which it most properly belongs is the subject of our plate, in which the cup-shape is more perfect than in the others. The general appearance of these flowers is too well known to need description; it will be more useful to the reader if we point out the differences between the three species most likely to be confused. The genus *Ranunculus* possesses distinct sepals and petals, normally five of each; but the petals are often one or two more in number, of burnished golden yellow, with a little scale towards the base, which makes a pocket containing honey.

Petal of Buttercup, showing honey-pocket.

I. Upright Crowfoot (*Ranunculus acris*), with stems 1 to 3

feet high. The rootstock is more or less erect. The lower leaves are divided into wedge-shaped segments, which are again much cut up—the upper leaves less intricately so. The petals are broad, and more or less flat when fully expanded. Flower-stalk *not* furrowed; sepals spreading. Meadows and pastures everywhere, June and July.

II. Creeping Crowfoot (*R. repens*). Rootstock stout, stem slanting, *with long rooting runners.* Flower-stalk *furrowed*, sepals spreading, but petals less so than in *R. acris.* Stem 1 to 2 feet. Pastures and waste places, too frequent, the rooting runners covering the ground with a net-work. Flowers May to August.

III. Bulbous Crowfoot (*R. bulbosus*). Stem erect, ½ to 1 foot, with turnip-shaped swelling at base; *no runners.* Flower-stalk furrowed, *sepals turned down*, nearly or quite touching the stalk; petals not spreading, but cup-shaped. Meadows everywhere, flowering from April to July.

The name Ranunculus is derived from the Latin, *Rana*, a frog, in allusion to the damp meadows and the ponds where certain species are to be found in company with frogs. Most of the species possess acrid and poisonous juices which cause them to be avoided by cattle. The Water Crowfoot, the Celandine, and Goldielocks, however, are not acrid. There are over twenty British species in the genus, several of which we shall refer to in later pages, but the sections containing terrestrial plants with divided leaves like the Buttercups include three annual species that may be briefly indicated:—

IV. Hairy Buttercup (*R. sardous*). Erect growing with many stems, rising to a height from ½ to 1½ feet, and bearing many flowers, which, though of the same size as the other Buttercups, are paler in colour. The furrowed flower-stalks and the sepals are covered with hairs, which either stand out straight or have a downward tendency. The sepals themselves are turned back against the stalk. It flowers from June to October, and affects damp ground, chiefly in England. The nutlets are much flattened, and bear a number of little knobs towards the margin.

V. Corn Crowfoot (*R. arvensis*). With erect stem as much as 2 feet high. The flower-stalks, though hairy, as in the last species, are not furrowed, and the

1 *Pl.* 4. **Lesser Celandine.** (p. 5.) *C* 4.

Ranunculus ficaria. RANUNCULACEÆ.

1 *Pl.* 5. **Traveller's Joy.** (p. 6.) *C* 5.

Clematis vitalba. RANUNCULACEÆ.

rest of the plant is smooth. The flowers are pale yellow, and only ½ inch across; the petals half-erect. The nutlets are covered with hooked spines. Flowers from May to July in cornfields. This species is considered to be the most acrid of the genus.

VI. Small-flowered Crowfoot (*R. parviflorus*). A hairy species with spreading, leaning stems, little more than ½ foot high, with more rounded, though divided, leaves. The flowers very small, not exceeding ¼ inch, often less, with from three to five petals. Nutlets covered with hooked prickles. Dry banks south of Durham; May to August.

Lesser Celandine (*Ranunculus ficaria*).

As soon as there comes a slackening of the iron rule of winter, whether it be early in February or late in March, then on sunny banks and at the feet of pasture-hedges, or on waste ground by the roadside, the burnished gold stars of the Lesser Celandine glitter in the wintry sunshine. It is a charming little plant in its brightness and compactness, and not in the least suggestive of weediness; yet, if introduced into the garden it can become an absolute nuisance. Its roots produce a large number of cylindrical tubers, which—when the "doctrine of signatures" was in fashion—were held to resemble hemorrhoids, and therefore to be medicinal for that painful malady: hence one of its folk-names—Pilewort. Each of these tubers is capable of producing a new plant, and reproduction by this method is speedily effected.

The leaves vary much in shape and in size. The larger, from the rootstock (radical), are more or less heart-shaped, the edges bluntly angled, marked with whitish patches, and sometimes with black or purple-brown blotches; the smaller ones, from the stem (cauline), may approach towards the form of an ivy-leaf. The sepals (calyx) vary from three to five, usually three, and the petals from seven to twelve. The stamens are numerous, as also are the carpels or divisions of the fruit. As in the Anemone and the Buttercups, these are *achenes*, a form persistent throughout the genus *Ranunculus*; each contains a

single seed. The plant is well distributed throughout the country, and may be found in flower until May.

Traveller's Joy (*Clematis vitalba*).

When rambling, in chalky districts especially, our readers will meet this climbing shrub at every turn, scrambling over all the hedges, flinging its arms out over the way, and clinging persistently to any branch or shoot it touches. It has a variety of names, some of which may be applied at different seasons by persons who think they are speaking of different plants. In the early summer it may be the White Vine, or the Virgin's Bower ; in autumn, when the feathery awns are lengthening on its seed-vessels, it may fitly be called the Old Man's Beard ; and when winter has cleared most things away from the hedges, but left these gleaming feathers in abundance, it may give the Traveller Joy to see them as he passes.

It is a perennial plant, with a tough stem—an under-shrub—climbing by means of its leaf-stalks, which curl round any likely support, and become hard as wire. The leaves are opposite and compound, the leaflets usually five, the stalks of these acting as tendrils. The flower has no corolla, but the four thick downy sepals are coloured greenish-white to serve instead. The stamens are a crowd round the central cluster of many-bearded styles, which afterwards elongate into plumy tails and jointly form the "old men's beards." The flowers, which are slightly fragrant, may be found from July to September. It is especially abundant on the chalk downs, where it ascends far up the trees, and forms stems as stout as a man's arm.

The Traveller's Joy is peculiarly English, so far as its natural distribution in the United Kingdom is concerned. It is found only to the south of Denbigh and Stafford. This, too, is the only British member of the genus ; but a very large number of foreign species with larger flowers are cultivated in our gardens.

1 *Pl.* 6. **Fumitory.** (p. 7.) *C* 6.

Fumaria officinalis. FUMARIACEÆ.

1 *Pl.* 7. **Winter Cress.** (p. 8.) *C* 7.

Barbarea vulgaris. CRUCIFERÆ.

The genus belongs to the Natural Order Ranunculaceæ, but differs from all our other native members of that order in its sub-shrubby character: the others being herbs.

The name is from the Greek *Klema*, a vine-twig.

Fumitory (*Fumaria officinalis*).

I have frequently found that the grace and lightness of the Fumitory suggest to the non-botanical mind some kind of relationship with the Maidenhair-fern; more especially is this the case with the lower portion of the plant. The leaves are thin and much divided. The flowers are peculiarly formed, and their arrangement is known as a *raceme*. Each consists of a couple of small sepals, and four petals arranged in two unequal pairs; the upper petal is spurred at the base, the lateral pair connected by their tips and completely enclosing the stamens and pistil.

The plant is common in dry fields and waste places throughout the three kingdoms, and, indeed, over a great part of the earth, for it is a plant that has followed close in the wake of cultivation. The name is an ancient one, derived from the Latin, *fumus*, smoke, some have said on account of the light, unsubstantial character of the plant; but, according to Pliny, because the watery juice brought on such a flow of tears that the sight was dimmed as by smoke. This is not very satisfactory; but nothing better in the way of explanation has been offered, so we must be content with it. It had formerly a great reputation in medicine. It flowers from May till September.

There are three other British species:—

I. Rampant Fumitory (*F. capreolata*), which climbs to a height of 2 feet by means of its twisting leaf-stalks. Its cream-coloured flowers are more loosely borne in the raceme than in *F. officinalis*. There are two sub-species of *F. capreolata*, separated from the type by minute differences in the size and tint of the flowers.

II. Small-flowered Fumitory (*F. densiflora*), similar to *F. officinalis*, but smaller and weaker, flowers paler, racemes short, leaflets smaller and narrower.

III. Least-flowered Fumitory (*F. parviflora*), with small, pale flowers and minute

sepals; racemes dense. The flowers are at first almost white, but become more purple later.

These three species are rare, the last especially so.

The genus belongs to the Order Fumariaceæ.

Winter Cress (*Barbarea vulgaris*).

Under the name of Land Cress, to distinguish it from *Nasturtium officinale* (the Water Cress), *Barbarea vulgaris* had once a fair reputation as a salad herb; but the cultivation of crisp and tender ingredients of the salad-bowl in our kitchen gardens has all but effaced our knowledge of the tougher, somewhat stringy, wild salads with which our forefathers had to be content. In general appearance, at a short distance, it is not very unlike Water Cress, showing a tuft of glossy, pinnate, dark-green leaves throughout the winter months, and from its heart sending up an erect, angular, leafy stem in spring, which bears dense racemes of small yellow flowers in May, on axillary branches. The stem-leaves, it will be seen, are very variable; some have merely a wavy margin, a couple of lateral lobes and ears (*auricles*) at the base; the larger ones have a big terminal lobe, and the lower portion is deeply cut in a pinnate manner. The lower leaves are truly pinnate, with a larger terminal leaflet. The plant is common on damp waste places.

The flower consists of four equal sepals, which are almost erect when the flower is open, not spreading widely. The four petals have the lower portion reduced to what is called a "claw," a bit of floral economy, of which we shall meet frequent examples where the sepals are erect or joined into a tube—notably in the Pink tribe. They are succeeded by long slender pods, compressed, and squarish in section, ending in a more slender point, the remains of the style.

There are several natural varieties, sufficiently marked to have been regarded as distinct species by some authorities, but which Hooker treats as sub-species; they are:—

Sub-sp. *B. stricta*, with upper leaves entire, and the lower with an oblong terminal lobe; flowers smaller; pods in a dense narrow raceme on erect footstalks.

Sub-sp. *B. intermedia*, with many leaf-segments, pods in dense raceme, four to six times as long as their footstalks.

American Cress (*B. præcox*) is a garden escape found by roadsides; probably a cultivated form of *vulgaris*. Leaves pinnatifid, segments narrow; petals three times as long as sepals; pods long and distant, scarcely thicker than their footstalks.

The genus is named after St. Barbara, and is included in the Order Cruciferæ.

Hairy Rock-cress (*Arabis hirsuta*).

The Rock Cresses, of which we have four native species, are lovers of dry rocky places, wall-tops, and the like. They are among the plants that ordinary flower-lovers neglect as "uninteresting," because generally inconspicuous. We have included several of such common plants in this work, with the distinct object of making them better known, feeling sure that it is not until we have learned a good deal about a plant that it becomes interesting. They are Cruciferous plants, like Winter Cress.

The Hairy Rock-cress (*A. hirsuta*) is the most widely distributed species. It is a biennial or perennial plant, covered with short, coarse hairs, with many slender leafy stems from 1 foot to 2 feet in length. The radical leaves form a rosette, and are scarcely stalked; they may be as much as 3 inches long. The stem-leaves are quite stalkless, and partly clasping the stem. The flowers are small; the sepals short, the petals white and spreading. They are succeeded by slender erect pods. The seeds, which form a single row, have a narrow wing all round them. It flowers from June to August, and may be looked for on walls, dry banks, and rocky places. It is generally distributed in Great Britain, but is only of local occurrence in Ireland. In Scotland it has been found in the mountains as high up as 2700 feet. There is a sub-species known as *Arabis ciliata*, in which the hairs are wanting or reduced to delicate cilia, the stem-leaves have a rounded base, and the pods are thicker and fewer in number. This form has been recorded

only from the rocky coasts of South Wales and the West of Ireland. The other species are:—

I. Alpine Rock-cress (*A. petræa*), a rare perennial confined to the mountain districts, where it ascends over 4000 feet. Stem 3 to 6 inches, branched. The leaves are stalked, the radical ones deeply cut into opposite lobes, the terminal lobe larger than the others; the stem-leaves with an almost entire margin. Flowers white or purplish, forming a corymb; June to August.

II. Bristol Rock-cress (*A. scabra*), a very rare, hairy perennial, confined to rocky places in Somerset and Gloucester. Radical leaves, shortly stalked, fringed with hairs, cut into wavy lobes that point upward. Stem 5 to 10 inches. Flowers large, cream-coloured, the petals wedge-shaped, narrow; March to May.

III. Smooth Tower Mustard (*A. glabra*). Nearly smooth; annual or biennial. Stem 2 to 3 feet, completely clasped by the stem-leaves. General aspect of plant pyramidal, due to decrease in size of upper leaves. Flowers pale yellow; May to July. Dry rocky places, local.

IV. Tower Rock-cress (*A. turrita*). Is an introduced species, from Central and Southern Europe, that has become naturalized on old castle and college walls in a few places, as at Cleish, Oxford, and Cambridge. It is covered with starry down, and its stem is more leafy. The larger pale-yellow flowers have spreading petals, and are succeeded by slender, curved pods from 3 to 6 inches long, containing *two* rows of seeds. It flowers from May to July.

Name said to be from Arabia, in allusion to their love of dry places, and from several of the species occurring in that country.

Lady's Smock (*Cardamine pratensis*).

In all moist meadows and swampy places, from March to June, the eye is pleased with a multitude of waving flowers which in the aggregate look white, but at close quarters are seen to be a pale pink or lilac. They are Shakespeare's "Lady's smocks all silver-white," that "paint the meadows with delight." The modern country name in many places is Milkmaids, or Cuckoo-flower. It is one of our best examples of the Cruciferous plants. Its leaves are cut up into a variable number of distinct leaflets; those from the roots having the leaflets more or less rounded, those from the stem longer and narrower. The radical leaves as they lie on the wet ground root at every leaflet, and develop a tiny plant from the axil of each. The plant

1 *Pl.* 8. **Hairy Rock-cress.** (p. 9.) *C* 10.

Arabis hirsuta. CRUCIFERÆ.

1 *Pl.* 9. **Lady's Smock.** (p. 10.) *C* 11.

Cardamine pratensis. CRUCIFERÆ.

sometimes sends off runners from the rootstock. The flowers are nearly $\frac{3}{4}$ inch across.

There are four other native species :—

I. Hairy Bitter Cress (*C. hirsuta*), with white flowers, $\frac{1}{8}$ inch in diameter, anthers yellow. In similar situations to *C. pratensis*. Flowers March to September.

II. Large-flowered Bitter Cress (*C. amara*), with creamy white flowers $\frac{1}{2}$ inch in diameter; anthers purple. It has a slender rootstock, which sends off runners. Riversides; rare. Flowers April to June.

III. Narrow-leaved Bitter Cress (*C. impatiens*), white flowers, $\frac{1}{4}$ inch across, often borne in a panicle; anthers yellow. Shady copses, local, southwards from Yorks and Westmoreland. It flowers from May to August. It is readily distinguished by the fringed auricles at the base of the leaves, which are not present in the other species, and by the explosion of the pod when touched.

IV. Coral Root (*C. bulbifera*), with a creeping rootstock covered with thick, fleshy, white scales. The unbranched stem may be a couple of feet in length. The leaves less divided; the lower ones having only one or two pairs of leaflets, whilst the upper ones are undivided and bear in their axils little bulbs, which drop off and perpetuate the plant. The flowers, which appear from April to June, are rather larger than those of *C. pratensis*, and usually of a darker lilac, though they may be white. The erect pods rarely ripen their seeds, probably because the plant has taken to the production of bulbs. It is a rare plant of wood and copse, with a range southward from Stafford to Kent and Sussex; it also occurs in Scotland. By some authors separated as *Dentaria bulbifera*. (See Series III., p. 13.)

Name from the Greek *Kardamon*, a kind of watercress.

Greater Celandine (*Chelidonium majus*).

We have already described (page 5) a plant bearing the name of Lesser Celandine, and we would at once warn the reader that the Greater Celandine is not even distantly related to the Lesser. Here is an illustration of the dangers that arise from dependence upon the folk-names of plants and animals. The novice would reasonably assume that the Lesser and the Greater Celandines differed only in point of size, whereas the resemblance that struck our forefathers appears to have consisted merely in both plants being in flower what time the swallow (*Chelidon*) returns to our shores. *Chelidonium majus* is really a kind of poppy, whilst *Ranunculus ficaria* is a buttercup.

There is only one British species of *Chelidonium*, a perennial plant, with erect branching stems. The true poppies have a white milky juice: this plant, like the Welsh-poppy (*Meconopsis*), and the Horned-poppy (*Glaucium*), has a yellow juice. The handsome leaf is much divided, the leaflets deeply lobed, with something of a resemblance to an oak-leaf. The rather small yellow flowers are combined in umbels, borne on a long stalk, to be out of the way of the somewhat erect leaves. There are two sepals and four petals, as in *Papaver* (see page 48), but the fruit, instead of being an urn-like capsule as in that genus, is a long pod with two valves, which separate from the base upwards, much as in the Crucifers. A similar form of pod in the Poppy family will be found in Yellow-horned Poppy (page 47).

It is a plant of the hedge-row and waste ground, near habitations, where it may be found in flower from May to August. The yellow juice, which is very acrid and poisonous, had formerly a reputation as an eye medicine, and as a caustic for the burning away of warts. Its claim to be considered a real native is not fully admitted by some botanists, who regard it as an escape from cultivated ground; but it does not appear to be cultivated anywhere at the present day.

Marsh Marigold (*Caltha palustris*).

In marshes, river-meadows, and wet copses in spring this is the most conspicuous plant, and to acquire it the rambler will not hesitate to risk getting wet feet. What time the sallow first puts out her silvery "palm," the Marigolds then "shine like fire in swamps and hollows grey" (Tennyson). In some districts it is the King-cup, May-blob, Mare-blob, and Marybud; in Scotland, the Luckan Gowan. It has a thick, creeping root-stock, and broadly heart-shaped glossy leaves with very large stipules and toothed edges. After flowering the leaves increase

1 *Pl.* 10. **Greater Celandine.** (p. 11.) *C* 12.

Chelidonium majus. PAPAVERACEÆ.

1 *Pl.* 11. **Marsh Marigold.** (p. 12.) *C* 13.

Caltha palustris. RANUNCULACEÆ.

in size considerably, and in some places they reach an enormous size for so small a plant. The flower has no petals, but the five sepals are enlarged and richly coloured, as with gold, and burnished. The centre of the cup is occupied by a number of carpels, which are surrounded by an indefinite crowd of stamens, and develop after fertilization into as many follicles containing great store of seeds. The plant is poisonous, but the unopened flower-buds are sometimes pickled, and used as a substitute for capers. The flowering time usually extends from March to May, but in some places flowers may be found as late as August.

There are several natural varieties of this plant, differing from the type in the size of the flowers and the attitude of the stem.

There is one other British species—some say it is a mere variety of the foregoing—Rooting Marsh Marigold (*C. radicans*), with triangular leaves and rooting stems. It occurs only in Forfarshire, and is very rare.

The name is derived from the Greek, *Kalathos*, a cup, in allusion to the form of the flower.

Water Crowfoot (*Ranunculus aquatilis*).

What the Wild Roses and the Brambles are to the "splitter" and species-monger, so in a minor degree are the aquatic species of Ranunculus ; they enable him to enjoy "delight of battle with his peers." Whether we accept the eight species of Hooker's "Student's Flora" or the much larger number of names that will be found in the works of various authors, or are content, on the other hand, to regard all as one species under the name of *Ranunculus aquatilis*, we shall find authorities to support our position. We should advise the beginner for his own peace of mind to commence by regarding the Water Crowfoots he meets in pond and stream as *aquatilis*, and by

making a fairly extensive collection of examples from various localities, amass material upon which he may found his own conclusions as to the validity of existing segregations. After careful study and comparison of the specimens in a number of magnificent collections, Hooker writes: "Opinions vary as to whether the eight forms, or even segregates of them, should be ranked as one or more species, sub-species, or varieties. . . . Of the characters attributed to these and their subordinate forms by critical authors, I find some variable, others valueless, and still others deceptive."

The form we have figured is the sub-species known as *Ranunculus peltatus.* It is distinguished by having the floating leaves somewhat kidney-shaped in general outline, but divided into three lobes or three leaflets; the submerged leaves finely divided into stiff, hair-like segments, which do not collapse into a shapeless mass when taken from the water. These submerged leaves, though they appear to be little other than stalks, have scarcely any footstalk beyond what is hidden by the very large stipules. The petals are broadly oval, with a yellow patch at the base; stamens few. It occurs in still waters, and flowers in May and June. Ponds are often found completely covered with the glossy, apparently greasy, floating leaves, and above them the straight flower-stalks and pure white flowers.

We have already alluded to the acrid character of the genus Ranunculus when dealing with the Buttercups (page 4). This property appears to have been developed by the plants as a defence against herbivorous animals, who might exterminate the Buttercups but for this deterrent. This view is greatly strengthened by the fact that the Water Crowfoot, growing where it is little subject to these attacks, is not acrid. Cattle who have access to shallow waters where this plant grows will wade out to feed upon it; and we have heard of farmers who drag it ashore for use as fodder.

1 *Pl.* 12. **Water Crowfoot.** (p. 13.) *C* 14.

Ranunculus peltatus. RANUNCULACEÆ.

1 *Pl.* 13. **Barberry.** (p. 15.) *C* 15

Berberis vulgaris. BERBERIDACEÆ.

Barberry (*Berberis vulgaris*).

The Common Barberry is a spiny shrub, growing in hedge and copse, and brightening the spot from April to June with its strings of pale yellow flowers, and later in the year with its oblong red berries. Its shoots attain a height of from 6 to 8 feet, and are clothed in a whitish bark, the wood being yellow. The leaves are egg-shaped, with the narrow end nearest the short stalk, and their edges armed with spine-like teeth. The flowers include eight or nine sepals and six petals : the outer sepals very small, and liable to be overlooked. The petals are in two series, and at the base of each petal are two honey-secreting glands, which induce the visits of honey-loving insects. There are six stamens, which ordinarily lie along the centre of the petals, their bases highly irritable. In an open flower like this any insect alighting on the stigma can get at the honey, but it is not easy to do so without touching the base of one of the stamens ; on this being done the stamen springs forward, and the anthers strike the insect, dusting it with pollen, and in some cases driving it away. This mechanism may be tested by touching the base of a stamen with the point of a pin. The insects that set this mechanism in motion are flies, bees, and beetles, with an occasional butterfly. The resulting berries are about ½ inch long, of an acid quality, but an excellent preserve is made from them.

In some places a Barberry may be found on the outskirts of parks and other enclosures, with much larger, holly-like leaves. This is the *Berberis aquifolium*, an introduced species which has escaped from cultivation.

The Barberry is very liable to the attacks of a minute fungus, a stage in the development of wheat-rust (*Uredo graminis*). The name *Berberis* is the Arabic title of the plant. *B. vulgaris* is at once the sole British member of the genus, and of the Natural Order Berberidaceæ.

Charlock or Wild Mustard (*Brassica sinapistrum*).

An upland cornfield in June with Charlock between the short corn-plants is a beautiful sight for the rambler, but the farmer may be pardoned if he fails to take the æsthetic view; for all that vegetable gold must be laboriously hand-picked, or "cleaned," as he would probably express it. Charlock is a weed that keeps close to the farmer, for it likes the comparatively light and dry soil of the ploughed field.

It is a hairy annual belonging to the cabbage tribe, which is a branch of the *Cruciferæ* or Cross-worts. The rough lyre-shaped leaves have boldly-toothed edges. In this and the two following species the four petals are bright yellow. The fruit is an angular pod, with a straight beak, not persistent, and two hairy valves, but containing only one row of dark-brown seeds. Flowers from May to August.

There are seven British species of *Brassica*, two of which may be confounded with *B. sinapistrum;* they are:—

I. Black Mustard (*B. nigra*). Stem *bristly*, upper leaves very narrow, lance-shaped, smooth, with entire or toothed margins. Pods awl-shaped, quadrangular. Beak short and slender, containing no seeds. Valves keeled. Seeds reddish-brown, oblong. Flowers June to September in hedges and wastes.

II. White Mustard (*B. alba*). Hairy, like *B. sinapistrum*, but the hairs pointing downwards. The upper leaves deeply lobed, lyre-shaped, the lobes being again cut and lobed. Stem marked with longitudinal incised lines. Pod short, no longer than the flat thin, or sword-shaped, ribbed beak. Seeds larger than the last, more globose, yellow. Flowers June and July in cultivated ground. The Mustards are sometimes separated as the genus *Sinapis*.

The other species are:—

III. Wild Cabbage (*B. oleracea*). Stem stout and twisted, 1 to 2 feet high. Lower leaves, egg-shaped, more or less lobed, fleshy, smooth, as much as 18 inches long; upper more oblong with broad base, stalkless. Flowers pale yellow, 1 inch across; May to June. Pods 2 or 3 inches long, with awl-shaped beak. Parent of all the cultivated forms of cabbage, kail, savoys, and cauliflower. South-west coasts of England and Wales; also Whitby and Staithes, Yorks. Perennial or biennial.

IV. Navew (*B. campestris*). Lower leaves lyre-shaped, bristly, glaucous; upper lance-shaped, clasping the stem. Flowers pale orange, June to September. Fields. There is a sub-species, *B. rapa* (the Turnip), which has a tuberous root, the leaves not glaucous, and the flowers smaller and bright yellow.

1 *Pl.* 14. **Charlock.** (p. 16.) *C* 16.

Brassica sinapistrum. CRUCIFERÆ.

1 *Pl.* 15. **Maiden Pink.** (p. 17.) *D* 17.

Dianthus deltoides. CARYOPHYLLACEÆ.

V. Isle of Man Cabbage (*B. monensis*). Rootstock woody. Stem ½ foot to 2 feet. Leaves so deeply cut into segments as to be almost pinnate; segments of root-leaves broad, those of the stem-leaves slender. Flowers pale yellow, ½ inch across: May and June. Pods 2 inches or more, with thick beak. On our western coast from Skye to South Wales, but at Merthyr Tydfil it occurs inland.

VI. Jersey Mustard (*B. adpressa*) is similar to *B. nigra;* but the stem is more branched and the leaves are bristly. The pods are more cylindrical, and the beak has eight ribs. It flowers in July and August, and may be found in sandy fields in Jersey and Alderney.

Maiden Pink (*Dianthus deltoides*).

We now make acquaintance with the great Pink order (Caryophyllaceæ), through a member of the typical genus of that order. All the species are characterized by their habit of growing in tufts, their narrow, grass-like leaves of firm texture, their tubular calyx, and general primness.

The Maiden Pink branches from its base, the branches slender and about a foot long. The leaves vary: on the upper part of the flowering shoots they are sharply pointed, lower down the points are blunted, and on the flowerless shoots they are strap-shaped. They are also downy, almost rough, and are disposed in pairs, their bases joined. The flowers are usually solitary, less than an inch across: calyx smooth, five-toothed, boldly ribbed, and with overlapping bracts below. The petals not touching, toothed at their edges; of a beautiful rosy colour, dotted with white. The flower is not odorous, but it secretes honey, and insects know it without the aid of scent. The honey is produced by a fleshy yellow gland at the bottom of the corolla-tube, so that only long-tongued insects like butterflies and moths can reach it. There are ten stamens and two long styles with curled stigmas; and the behaviour of these organs is worthy of observation in the growing plant. Five of the stamens emerge through the narrow mouth of the flower, mature, and the anthers open to discharge their pollen. Butterflies and moths come to obtain honey and pick up some of this pollen on their hairy bodies. Now come forth the remaining

five and shed their pollen. After an interval the styles appear, and their stigmas mature, occupying such positions that if a honey-hunting butterfly has just been visiting a younger pink-flower and has any of the pollen about her, some of it is certain to be detached by these stigmas, and so cross-fertilization will be effected. Flies that come to feed upon the pollen must also assist in this work of pollen-carrying. The Maiden Pink is a perennial, and flowers from June to September; it may be sought in fields and on banks where the soil is dry.

There are three other native species of *Dianthus*, and two of alien origin that have become naturalized on old walls. They are as follows:—

I. Deptford Pink (*D. armeria*). The stems of this plant are few in number, and taller than those of Maiden Pink, quite erect. The leaves are very slender. The flowers are ½ inch across, produced in small bunches with downy bracts below them; the rosy petals have their margins toothed. It is an annual plant, flowering on dry banks in July and August, and its range extends from Forfar to Cornwall and Kent.

II. Proliferous Pink (*D. prolifer*) is also an annual, with several stems a foot or more high. The leaves are short and downy, of a narrow lance-shape with rough edges. The purplish-red flowers (½ inch or less across) are gathered into heads, but only one flower opens at a time. The petals have notched margins, the slender calyx is slightly ribbed, and the bracts are dry and brown. It flowers in gravelly pastures south of Perth, from June to October.

III. Cheddar Pink (*D. glaucus*). Is a rare perennial confined to the limestone rocks of the locality that gives its name. It has solitary, fragrant, rosy flowers, 1 inch across, with toothed petals, which appear in June and July. The Wild Carnation (*D. caryophyllus*) and the Wild Pink (*D. plumarius*), the originals of our garden Carnations and Pinks, are also to be found occasionally on old walls. They are not native, but have become naturalized in places.

Name from the Greek words, *Dios*, Jove, and *anthos*, flower.

Setterwort (*Helleborus fœtidus*).

Ramblers in the chalk districts of Southern and Eastern England may come across this curious plant, though it is the reverse of common. It may be found also occasionally in other parts of the country, but then only as a naturalized plant. The Setterwort, or Stinking Hellebore, is a coarse-growing perennial,

1 *Pl.* 16. **Setterwort.** (p. 18.) *D* 18.

Helleborus fœtidus. RANUNCULACEÆ.

1 *Pl.* 17. **Jack-by-the-Hedge.** (p. 19.) *D* 19.
Sisymbrium alliaria. CRUCIFERÆ.

its large radical leaves divided into a number (five or six) of narrow leaflets ; those that occur on the upper part of the flowering stem are more or less reduced to the condition of divided bracts. The flowers are rather puzzling at first sight, for the large purple-bordered sepals quite hide the small tubular petals, which are shorter than the many stamens. The petals are indeed turned into drinking-cups, for they are filled with nectar for the delectation of insect visitors. The flowers assume a globular form until after fertilization, when the stamens and petals drop off, and the sepals spread as shown in parts of our plate. The flowers are numerous, borne in a loose panicle, and their odour is fetid. The name Setterwort has no very clear meaning in the present day. It was used by Gerarde in his *Herbal*, and is probably a corruption of Satyr-wort, signifying a plant that could be used medicinally to counteract Satyr-like tendencies in the patient.

There is another British species, the Bear's-foot, or Green Hellebore (*H. viridis*), a smaller plant with fewer flowers, and only the root perennial. Its yellowish-green sepals are more spreading than those of *fœtidus*, and the flowers are less drooping than in that plant. Both flower from February to April, but the blossoms of *fœtidus* appear before those of *viridis ;* both are highly poisonous.

'*Elleboros* was the Greek name of these plants.

Jack-by-the-Hedge (*Sisymbrium alliaria*).

Jack-by-the-Hedge rejoices in the *aliases* of Garlic-mustard and Sauce-alone. It cannot be called a particularly interesting plant, but we have specially included it here because it is one of those plentiful hedgerow weeds that people are constantly meeting with, and as regularly ignoring, its lack of beauty or showiness making it not worth "working out." It is an erect-growing, fresh-looking plant, though at first its stems had an

inclination to grovel instead of rising. The leaves are more or less heart-shaped, with rounded teeth at the edges, on long stalks of soft texture, and hairy beneath. All through the winter these leaves are very conspicuous at the hedge-foot, where they attain a large size, before the erect stem begins to rise. It has a strong smell when bruised, suggestive of garlic. The flowers are small, white, the four petals arranged cross-wise. The pods are about $2\frac{1}{2}$ inches long, slightly curved, the valves being keeled, which gives a four-angled appearance to the pod. It flowers in May and June. In the latter month the caterpillar of the Orange-tip butterfly may be found feeding upon its pods, which they very closely resemble, so that a sharp eye is needed to distinguish the caterpillar from the seed-vessel. Other native members of the genus are :—

I. Thale Cress (*S. thaliana*). Another common hedgerow and wall-top weed, with few leaves and inconspicuous white flowers. Radical leaves, oblong, toothed, stalked, forming a rosette. Stem leaves stalkless, narrow, all downy. Flowers $\frac{1}{8}$ inch diameter ; May to September. Pods, $\frac{1}{4}$ to $\frac{3}{4}$ inch, curved.

II. Hedge-Mustard (*S. officinale*). Leaves deeply cut or lobed, toothed, hairy. Stem round, erect, with horizontal branches. Flowers very small ($\frac{1}{10}$ inch), pale yellow. Pods, $\frac{1}{4}$ inch, round, awl-shaped, close to stem. Flowers June and July.

III. Flixweed, or Fine-leaved Hedge-mustard (*S. sophia*). A tall plant growing among rubbish shot on waste places, as much as 3 feet high, with leafy branches and much divided leaves, the segments very fine. Flowers small ($\frac{1}{8}$ inch), yellow, succeeded by slender, rounded pods (1 inch), with three ribs on each valve. Flowers June to August.

IV. London Rocket (*S. irio*), so called because it sprang up abundantly in the Metropolis immediately after the Great Fire of London (1666). Approaching *S. officinale* in habit and character of leaves. Flowers yellow. Pods slender, smooth, round, 2 inches long ; valves as in *S. sophia*. May to September.

Name, Greek, believed to have been applied to a species of cress.

Field Penny Cress (*Thlaspi arvense*).

This is the Mithridate Mustard of old writers, by whom it was regarded as a valuable antidote to poisons. In many districts of England it is common in cornfields and on roadside wastes, but in the northern kingdom it is not nearly so plentiful. It is

1 *Pl.* 18. **Field Penny Cress.** (p. 20.) *D* 20.

Thlaspi arvense. CRUCIFERÆ.

1 *Pl.* 19. **Red Campion.** (p. 22.) *D* 21.

Lychnis dioica. CARYOPHYLLACEÆ.

an annual plant, whose first leaves form a rosette upon the ground. Then up springs a slender, unbranched stem, bearing leaves whose general outline is that of an arrow-head, with waved teeth along the margins; above the leaves are many small white flowers, which are succeeded by much larger heart-shaped seed-vessels on long slender stalks which stand out from the stem almost horizontally. The flower parts are in fours, arranged crosswise. It flowers from May to July.

Now, this description is very like what we have written of a much more plentiful species, the Shepherd's Purse (*see* page 29), and therefore to prevent confusion we will try to tabulate those points in which they differ most—

	Penny Cress.	Shepherd's Purse.
Stem	Unbranched (*simple*).	Branched.
Flowers	$\frac{1}{4}$ inch in diameter. Sepals *erect.*	$\frac{1}{10}$ inch in diameter. Sepals spreading outward.
Seed-pods	Spherical, much flattened, with *broad wing* all round. $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter.	Heart-shaped, valves boat-shaped, *keeled.* $\frac{1}{4}$ to $\frac{1}{3}$ inch in diameter.
Seeds	Five to eight in each cell.	Many in each cell.

If we soak a seed of each and skin it, we shall find a further and important difference. In that of Shepherd's Purse we shall find the embryo-root bent over on one of the future leaves; this would be described as "radicle incumbent." In the seed of Penny Cress we should see the root lying along the edges of *both* the seed-leaves (*cotyledons*), and should describe it technically as "radicle accumbent."

There are two other British species, both rare:—

I. Perfoliate Penny Cress (*T. perfoliatum*) occurs on limestone soils in East Gloucester. Its stem-leaves are heart-shaped, the root-leaves spoon-shaped. Pods small, *heart-shaped*, the upper part only winged. Flowers April and May.

II. Alpine Penny Cress (*T. alpestre*). Mountain pastures only, reaching an altitude of 2500 feet. Root-leaves oval, stalked. Stem-leaves arrow-head shaped. Pods *oval*, dented at top, valves winged above. Flowers June to August.

The generic name is Greek, from *thlaso*, flattened, in obvious reference to the pods.

Red Campion (*Lychnis dioica*).

Though the Campions cannot be said to resemble the Pinks we have lately been considering, there is a good deal in their appearance that suggests near relationship. There is the same slender, rounded, grass-like jointed stem, and the neat leaves are given off in pairs at the joints, though in this case both stems and leaves are downy. In a general way the structure of the flowers is similar, the calyx being tubular, and the petals having a long slender claw, so that the greater part of their surface may be expanded outside the mouth of the calyx. There are five styles instead of the two that suffice for *Dianthus*. But both genera are included in the natural order Caryophyllaceæ.

The Red Campion is a perennial plant of the damp hedge-bank and copse-side, which it continues to beautify from June to September—and in sheltered places till much later. It is covered with soft hairs, and towards the extremity of the stems these become glandular, as in the Catchflies, and secrete a glutinous substance. The stems grow to a height of 3 feet, forking repeatedly above. The root-leaves are egg-shaped, but those on the stem are much narrower. The calyx is dark red, and the petals are rosy pink. The broad portion, or *limb*, of the petal is cleft into two lobes, and where it narrows to the claw there will be found a couple of little scales that are erect. If we care to pull a few of these flowers to pieces we shall find that they do not all agree : in some we find stamens, but the pistil with its five stigmas is absent or in an undeveloped state ; in others the reverse is the case, the pistil being complete whilst the stamens are wanting. The flowers are—in botanical language—*diœcious;* and this arrangement necessitates the kindly agency of insects in the transfer of pollen from staminate flowers to those with pistils. The result of such cross-fertilization is the development of the ovary into an egg-shaped capsule, which splits at its smaller end into five teeth, which curve outward to set free the ripened seeds.

1 *Pl.* 20. **Greater Stitchwort.** (p. 23.) *D* 22.

Stellaria holostea. CARYOPHYLLACEÆ.

1 *Pl.* 21. **Woad.** (p. 24.) *D* 23.

Isatis tinctoria. CRUCIFERÆ.

Red Campion is generally distributed throughout the British Islands. Its nearest ally is—

White Campion (*Lychnis alba*), which agrees in a general way with Red Campion, but its calyx is greenish with longer teeth, the petals are white, the seed capsule is more conical, and its teeth instead of curling outwards stand erect. The new flowers, too, always open in the evening, when they become fragrant. It flowers in fields and hedgerows from June to September, and its pure white blossoms are very conspicuous at night, in order to attract the moths by which it is cross-fertilized. Linnæus classed the Red and the White Campions as two varieties of one species, and there can be little doubt of their common origin and close relationship.

Other species of Lychnis will be found on page 28. The name of the genus is the Greek *Luchnos*, a lamp or torch, the application of which requires a little more light shed upon it.

Greater Stitchwort (*Stellaria holostea*).

One of the prettiest and most characteristic sights of Spring is the mass of brittle, grass-like stems and leaves of the Greater Stitchwort, crowned by the numerous flowers of gleaming white clear-cut stars. It starts life as an erect-growing plant, but is soon fain to lean against the other constituents of the hedgerow as its stems elongate but grow no stouter. It is a perennial plant, and its four-angled stems make their appearance very early in the year. The long, narrow, rigid, sharp-pointed leaves are arranged in pairs, which are more or less connected at their bases. The flowers are produced in a panicle of a few flowers only, and consist of five almost nerveless sepals, five petals which are as long again as the sepals and cleft almost to the middle. They brighten the hedgerows from April to June, and are succeeded by a globose capsule containing many seeds. There are ten stamens and three styles, and there is really a touch of something very like altruism in the order in which these are produced. Five of the stamens elevate themselves so that the anthers come out of the tube and discharge their pollen. That pollen is produced for the good of the species, for it can be of no service to the flower that

produced it. When carried by some insect it serves to fertilize another flower. The second set of stamens and the three styles mature at the same time.

The genus Stellaria contains six other native species :—

I. The Lesser Stitchwort (*S. graminea*) is a similar, but much more slender perennial plant, with exceedingly narrow leaves, smaller flowers arranged in a much-branched panicle, and with red anthers. After flowering the flower-stalks hang downwards, but as the capsule ripens they rise to a horizontal position. The sepals are as long as the narrow petals, united at their bases, and have three nerves. Capsule nodding. Flowers May to July.

II. Water Stitchwort (*S. aquatica*) may be found scrambling over bushes at the side of streams. It has long (3 feet), angular, and brittle stems, which on arising from the perennial rootstock, spread around before climbing. The leaves are egg-shaped, with heart-shaped base, thin textured, the lower ones shortly stalked. The flowers are produced in the axils of the leaves, are ½ inch across, and the white petals have diverging lobes. There are usually five styles, rarely three. July and August. Range, from Yorks southward.

III. Wood Stitchwort (*S. nemorum*) is a plant of the copse and grove, from South Wales and Hereford to Dumbarton and Moray. It is a perennial with stouter, round, and shining stems, sometimes naked, sometimes hairy. Leaves large, egg-shaped, with fringed margins. Flowers white, ¾ inch across, the sepals with transparent margins. May to August.

IV. The Common Chickweed (*S. media*) is an annual member of this genus. The stem trails along the ground, is very brittle, and marked with a line of fine hairs up one side. The flowers are inconspicuous, on account of the sepals being longer than the petals, which are, in fact, often absent altogether. It grows everywhere, and may be found flowering throughout the year. It has followed the Briton wherever he has gone about the earth.

V. The Marsh Stitchwort (*S. palustris*). Smooth, with a fine bloom (*glaucous*). Sepals united at base, three-nerved, not so long as the petals. Flowers solitary on long stalks. Marshes and wet places. May to July.

VI. Bog Stitchwort (*S. uliginosa*). A perennial plant of bogs and marshes, with smooth, four-angled stems and oblong leaves of a glaucous hue, with thickened pointed tips. The white flowers are only ¼ inch across, and the sepals are longer than the petals. It is widely distributed, and flowers from May to July.

The name of the genus is from the Latin, *Stella*, a star, in reference to the star-like character of the blossoms.

Woad (*Isatis tinctoria*).

Few plants are so closely connected with the history of a great nation as the Woad. Shakespeare's familiar remark that

the fragrance of the Rose is not due to its name, has many applications other than to Roses ; and probably the destiny of this country would in no sense have been changed had it been called Patagonia from early times. But the philologists say that the word "Briton" is derived from the Celtic *brith*, or *brit*, meaning "painted," because, as we are told by Cæsar, the ancient Britons stained their bodies with the juice of Woad, doubtless to eke out a scanty wardrobe. The conquering Saxons took the hint, and used the same juice for dyeing their garments instead of their skins, and began to import it from the Continent, and probably to cultivate it also, as is done in Lincolnshire to this day, even though the use of indigo has almost abolished the employment of Woad.

Isatis tinctoria is a tall, erect biennial herb, with a smooth, stout stem, branching towards the top and attaining a height of 2 or 3 feet. Its radical leaves are more or less lance-shaped, with long stalks, whilst its stalkless stem-leaves are shaped more like arrow-heads than lance-heads. The small yellow flowers show that *Isatis* belongs to the order Cruciferæ. They are less than $\frac{1}{4}$ inch across, and are crowded into erect panicles. The sepals are equal at the base, and the petals equal. The footstalks continue to lengthen after flowering, and curve downwards, so that the thick-winged, oblong seed-pods are all pendulous. These pods are about $\frac{1}{2}$ inch long, brown when ripe. The flowers may be found in July and August.

It is regarded as being a long-naturalized waif of former cultivation, but at Tewkesbury, on cliffs by the Severn, it is believed to be truly wild. Between Gomshall and Guildford, in Surrey, it has long been naturalized. This is the only species found in this country.

The name of the genus is the same as that used by the ancient Greeks for these plants.

Wild Mignonette (*Reseda lutea*).

So familiar is the Sweet Mignonette of our gardens, and so like and yet unlike are the wild species, that whilst no one would take them for the garden plant, one need not be a botanist to see their natural affinities at a glance. Like their garden relative these are annual herbs, becoming biennial when we have mild winters ; with flowers that are individually inconspicuous, but which gain sufficient prominence by being associated in racemes. In colour they are a yellow-green. The calyx is irregular, and divided into from four to seven narrow segments ; there is a similar number of unequal petals, each deeply cleft into two lobes, and a multitude of stamens. The stigmas are lobes at the mouth of the open ovary.

I. Wild Mignonette (*R. lutea*) grows in dry waste places, especially in chalky districts. Its leaves vary a great deal, but are either pinnate or deeply lobed in a somewhat irregular manner. Flowers, pale-yellow in a tolerably dense raceme. Very similar to the Sweet Mignonette, but stiffer, more erect, and scentless, though honeyed. Flowers June to September.

II. Weld (*R. luteola*). This is a much taller plant than *R. lutea*, with longer racemes and denser; the flowers more green than yellow, and with undivided glossy leaves. Petals, three, four, or five. In the days before aniline colours this plant was much used by dyers, and cultivated for their purposes. It yields a beautiful yellow dye, and its juice is also used in the preparation of the artist's colour called Dutch pink. It is a common wayside plant in England and in Ireland, more rare in Scotland, and flowers from June to September.

A third species of similar dimensions to *R. lutea*, but with longer racemes of dirty-white flowers, may be found in a few places—such as Weston-super-Mare, Marazion, and Bootle. This is the Upright Mignonette (*R. suffruticulosa*), a plant

1 *Pl.* 22. **Wild Mignonette.** (p. 26.) *D* 26.

Reseda lutea. RESEDACEÆ.

1 *Pl.* 23. **Red Sandwort Spurrey.** (p. 27.) *D* 27.

Spergularia rubra. CARYOPHYLLACEÆ.

apparently introduced into this country with ballast, for it is not native.

The name is from the Latin, *Resedo*, to appease, from these plants being formerly considered as sedatives. It is the only native genus of the order Resedaceæ.

Red Sandwort Spurrey (*Spergularia rubra*).

The " Floras " give descriptions of several species of *Buda* or *Spergularia*, but these vary so and overlap in such a manner that we are inclined to agree with Hooker that his four species are merely sub-species of one. Although common and widely distributed in this country, Sandwort Spurrey is by no means a well-known plant ; yet it is exceedingly pretty and neat. Its various forms occur in gravelly soils, about salt marshes, and among seaside rocks. The specimen which sat for the following pen-portrait grew with its woody rootstock jammed in a crevice of the rocks, just above high-water mark, below our Cornish home. From the rootstock a great number of slender ruddy jointed stems start off, but remain almost prostrate. At the joints the leaves grow in little bunches, surrounded by semi-transparent silvery stipules ; each leaf in a bunch being of different size from the others, almost cylindrical, thicker towards the free end, and bluntly pointed. The upper portions of the stems, also the sepals, are covered with short, glandular hairs. There are five sepals of a ruddy-green colour. The petals, too, are five, of a bright rosy tint, the under-surface paler. Stamens ten, the anthers bright yellow. Stigmas three. When the flower has faded, its short stalk hangs down, but when the seeds are ripe the stalk again becomes erect. It flowers from June to September. (See also Series III, p. 26.)

The genus is included in the order Caryophyllaceæ.

Ragged Robin (*Lychnis flos-cuculi*).

Like the Celandines, Ragged Robin was known to our fathers as a Cuckoo-flower; in fact, in many parts of the country its name is still "Cuckoo-flower," but as that title is also given to the Ladies'-smock confusion is caused by its use.

The habit of the plant will suggest the Stitchwort, to which it is not very distantly related, though a much nearer relation is the Red Campion, already described (page 22). It is a perennial plant, delighting in moist places, whether wet meadows, ditch banks, or bogs. Its stem rises to a height of about 2 feet, and is reddish, the upper part rough and sticky. The lance-shaped leaves that spring directly from the slender rootstock are stalked; the more slender ones on the reddish stem are not. The calyx is dark red, with purple veins; the rosy petals cut into four toothed narrow segments, of which the two inner ones are very long, so that the extreme diameter of the flower is about $1\frac{1}{4}$ inch. The flowers produce honey, and the stamens come to maturity before the stigmas, thus favouring cross-fertilization. Flowers May to August. Occasionally the flowers may be found with undivided petals, and rarely the flowers are white.

Two other species of Lychnis are native, in addition to those described at page 23, but they are rare. They are :—

I. Red Catchfly (*Lychnis viscaria*). Found only locally on trap-rock formations in Scotland and North Wales. It is a perennial with a woody rootstock, from which rises a stout smooth stem which is sticky at the joints. The narrow lance-shaped leaves are long and stalked. The purplish-red flowers are 1 inch across, the petals merely notched. They are in evidence from June to August.

II. Mountain Catchfly (*L. alpina*) is not sticky as its name would imply. It grows in a tuft of short (6 to 8 inches) smooth stems from the perennial rootstock, and the very slender leaves are much closer on the stem than in the other species. The rosy flowers are about $\frac{1}{2}$ inch across, the petals much more deeply cleft into two lobes. It flowers in June and July, and is found on alpine moors and in ravines only in a few places. Of these, one is in Lancashire, another at the summit of Little Kilrannoch, Clova, Forfarshire, and the third Hobcaster Fell, Cumberland.

1 *Pl.* 24. **Ragged Robin.** (p. 28.) *D* 28.

Lychnis flos-cuculi. CARYOPHYLLACEÆ.

1 *Pl.* 25. **Shepherd's Purse.** (p. 29.) *D* 29.

Capsella bursa-pastoris. CRUCIFERÆ.

Shepherd's Purse (*Capsella bursa-pastoris*).

One need not travel far to find a specimen of Shepherd's Purse, for almost any spot of earth that man has tilled will furnish it, though it has a preference for light soils. Wherever his fork or spade has gone in temperate regions this plant has gone with him, and stayed. The entire plant is hairy. The radical leaves are pinnately cut, but those high on the stem are arrow-shaped with toothed edges. The flowers are very minute, white, without honey or scent, and are succeeded by the heart-shaped seed-vessel (capsule) which gives its name to the whole plant, from its resemblance to an ancient form of rustic pouch. This splits into two valves, and the numerous seeds drop out. In stature the plant varies greatly, according to the position in which it grows—on a gravel path being only 2 or 3 inches high, whilst in a garden border it may be almost as many feet. Flowers throughout summer. An alternative name is Pick-pocket. There are no other British representatives of this small Cruciferous genus.

The name is Latin, a diminutive form of *Capsula*, a little box.

Bladder Campion (*Silene cucubalus*).

The Bladder Campion, or White Bottle, belongs to a group familiarly known as Catch-flies, owing to certain species being coated with short sticky hairs, to which green-fly and other small fry adhere with fatal results. *Silene* is very similar in structure and appearance to the allied genus *Lychnis*. There is the same neatness of "habit" given by the slim round stem, with enlarged joints where the pair of leaves is given off Bladder Campion is frequent on roadside wastes and on the margins of cornfields. It is a perennial, with a stout rootstock, and erect branching stems, rising to 2 or 3 feet. Both stems and leaves are of a glaucous tint. The bracts are thin and

dry. The sepals are united to form a greatly swollen bladdery-looking calyx of grey-green colour with a darker network of nerves. The mouth of this bladder is cut into five teeth, to indicate the sepals of which it is composed. The five petals are each deeply cloven into two narrow segments, and just below this cleft there are two scarcely noticeable scales. There are ten stamens, but the number of styles varies from three to five. The flowers, which are numerous and gathered into a panicle, are all drooping ; they are of three forms—male, female, and bisexual. In the first two either the stamens or pistils are imperfect and unfit for their office ; in the third all the organs are complete. June to September.

There are seven other British species, among them :—

I. Sea Campion (*S. amœna*). We are doubtful if this is entitled to specific rank. The tyro may have difficulty in separating it from *S. cucubalis*. The stems are spreading instead of erect ; shorter ; leaves smaller ; flowers larger, one to four only in a panicle. Petals not so deeply cloven, the segments broader and the scales larger, more evident. Bracts green and fleshy. Flowers May to September. Rocky and sandy seashores.

II. English Catchfly (*S. anglica*). A hairy, sticky, annual plant ; the lower leaves spoon-shaped, the upper variable. The white or pink flowers borne singly in the axils of upper leaves. Petals usually cleft slightly, small. Calyx with green, downy ribs and bristle-like teeth. Flowers June to October, in sandy and gravelly fields ; often an escape from gardens. A variety with entire white petals, each with a red spot, is known as *var. quinquevulnera*. It occurs in the Channel Islands.

III. Moss Campion (*S. acaulis*). This little perennial sends up its short smooth stems in tufts, which have a very moss-like appearance. The leaves are awl-shaped and closely set, fringed with fine hairs. The pink flowers (occasionally white) are about ¼ inch in diameter, erect, and solitary ; stamens and pistils usually in separate flowers. June to August. Alpine rocks, ascending to 4300 feet. In Ireland it occurs only in Donegal.

IV. Nottingham Catchfly (*S. nutans*). A tall-growing perennial (2 to 3 feet) with downy stems, the upper part together with calyx sticky. Lower leaves stalked, broad, lance-shaped, stem-leaves narrow and sessile. The pink or white flowers are about ½ inch across, and droop from panicled cymes. The petals are deeply cleft into two narrow segments. The flowers are fragrant, though they produce no honey ; and there are long and short-styled forms to assist in the work of cross-fertilization. To this end also the behaviour of the flower contributes. Seen in the day-time the flowers all appear to be faded ; but their insect friends are the moths, and so at night they expand their petals and pour forth their fragrance. Each flower lasts for three nights. The first night it puts forth five stamens, and their anthers discharge the

1 *Pl.* 26. **Bladder Campion.** (p. 29.) *D* 30.

Silene cucubalus. CARYOPHYLLACEÆ.

1 *Pl.* 27. **Columbine.** (p. 31.) *D* 31.

Aquilegia vulgaris. RANUNCULACEÆ.

pollen. The second the remaining five stamens occupy their places, and discharge their pollen. The third night the styles, whose stigmas are only now mature, take up the position, and usually get pollen brought from a newer flower. It is a rare and local plant, exhibiting a preference for chalk and limestone. Flowers May to July.

V. Night-flowering Catchfly (*S. noctiflora*). An annual, covered with soft down, of wider distribution than the last, but more frequent in the eastern half of our island. The stems are erect (1 to 2 feet), slightly branched, and sticky at the top. Leaves broadly lance-shaped. Flowers ¾ inch across, erect. The petals, which are rosy within and yellow without, curl up during the day, and reopen at night, when the flower becomes fragrant. July and August.

Name from the Greek, *sialon*, saliva, in allusion to the stickiness of *S. anglica* and others.

Columbine (*Aquilegia vulgaris*)

It is a difficult thing to decide, when one has found the Columbine growing wild, whether it is not a garden escape that has increased and become naturalized. One should always be chary of assuming its true wildness, if it is found near an existing house or the site of a former dwelling. But that the Columbine is a true native of woods in England and Ireland there can be no doubt.

Columbine forms a rootstock from which the radical leaves grow in bundles, each leaf-stalk spreading out at its base into wings which enwrap the next newer leaf, and from the centre of the bundle rises the flowering stem. The long-stalked leaves are divided into two or three portions, each stalked and again cut into small leaflets which are lobed and toothed; they are of a glaucous hue. The long flower-stalks are leafy, and bear many flowers in a panicle, all drooping. The flower parts are in fives. The sepals are thin and broad, coloured dull purplish or blue like the petals. The concave petals terminate at the back in a curved hollow tube, with a hollow knob at the end in which honey is secreted. The ovary consists of five carpels, each with its own style and stigma. The stamens mature before the stigmas, so that cross-fertilization takes place. At first the stamens bend downwards, but successively rise up as

they mature, and come in the way of bees seeking the honey, who will thus convey the pollen to a flower that opened earlier and now has its stigmas ripe. After fertilization, as the sepals and petals fall, the flower-stalk erects itself, and the carpels develop into dry leathery bags (*follicles*), which split along the upper edge and disclose a large number of very glossy, greenish-black seeds. Flowers May to July.

The name is derived from the Latin, *aquila*, an eagle, the petal and spur inverted being supposed to resemble the head, neck, and shoulders of that bird. Similarly, the popular name is derived from the Latin, *columba*, a dove, whose likeness is feigned by the same parts. This is the only native species of the genus, which belongs to the Ranunculus family.

Rock-rose (*Helianthemum chamæcistus*).

On our chalk-downs, and on banks in gravelly soils, from June to September the pale yellow flowers of the Rock-rose are abundant. In spite of its plentifulness, however, it is not among those flowers that are generally known, except to the botanist. The rest of the world probably includes it among the buttercups, with which it has no relationship. The plant is shrubby, with a creeping rootstock ; its branches trail on the ground among grass and low herbage. It is therefore by no means a conspicuous plant, though it occurs in considerable masses, and is perennial. The leaves are small, oblong, with an even margin ; the upper surface hairy, the lower downy. They are arranged in pairs on the stem, and provided with long, slender stipules.

The flower-bud is protected by only three sepals, but there are two others reduced to the size and shape of stipules ; and so their number really corresponds with the five somewhat flabby petals, which have the softness of the poppy rather than the stiffness of the buttercup. The open flowers vary from $\frac{3}{4}$ to

1 *Pl.* 28. **Rock-rose.** (p. 32.) *D* 32.

Helianthemum chamæcistus. CISTACEÆ.

1 *Pl.* 29. **Treacle Mustard.** (p. 33.) *E* 33.

Erysimum cheiranthoides. CRUCIFERÆ.

$1\frac{1}{4}$ inch across. The stamens that surround the pistil are a multitude; they are also irritable, and on being touched fall back from the pistil. The plant is common throughout the country, except in Cornwall and West Scotland, in which districts it is rare.

There are three other British species :—

I. White Rock-rose (*H. polifolium*). Similar, but more shrubby; margins of leaves curled back. *Flowers white.* Very rare. Stony places in Somerset and South Devon. May to July.

II. Spotted Annual Rock-rose (*H. guttatum*). An annual, of erect habit; the lower leaves opposite, without stipules; the upper alternate, with stipules. Petals wedge-shaped, *yellow*, with a *red spot* at the base of each. It occurs only near Cork and in the Channel Islands. June to August. A sub-species, *H. breweri*, is found in Anglesey at Holyhead.

III. Dwarf Rock-rose (*H. canum*). More woody than the others; stems trailing. The whole plant *hoary*, and much branched. Leaves opposite, without stipules. Flowers yellow, not numerous, and scarcely exceeding $\frac{1}{2}$ inch across. May to July, from Glamorgan to Westmoreland.

The name is Greek, and signifies sunflower.

This is the only native genus of the order Cistaceæ.

Treacle Mustard (*Erysimum cheiranthoides*).

This is another of the neglected Crucifers that grows in the waste places of fields and roadsides. An annual plant, covered with short, forked hairs which impart a frosted appearance. The stem is round, straight, leafy, from 1 to 2 feet. Leaves narrow, lance-shaped, scarcely stalked, narrower at the base, the margins faintly toothed. The flowers are small, about $\frac{1}{4}$ inch across; the petals clawed, yellow. The pods are about 1 inch in length, slender and square; the valves with a prominent keel, nearly erect. It flowers from June to August. It is not uncommon in the southern half of England, but in the northern half and in Ireland it is rare. This is the only British species. It is closely allied to the Garlic Mustard (*Sisymbrium*), described on page 19.

The name of the genus is said to be from the Greek, *eruo*, to draw, in allusion to its former use as a blistering agent.

Yellow Water-lily (*Nymphæa lutea*).

In some districts, where the Yellow Water-lily floats on the bosom of ponds and sluggish streams, it is known as the Brandy-bottle, partly by reason of its unpleasant odour and partly on account of its flagon-like seed-vessel.

It has a thick fleshy rootstock, which creeps in the mud, and is rich in tannic acid ; it is said to be a fatal lure to cockroaches if bruised and soaked in milk. Some of the leaves are submerged, and these are thin, but the floating ones are thick and leathery. The leaves are heart-shaped, the lobes not far apart : the stalks somewhat triangular in section, and traversed by a great number of fine air-canals, as are the flower-stalks also, to give them buoyancy. The most conspicuous portion of the flower is the yellow sepals, five or six in number, which are very large and concave. The petals are much smaller, and number about twenty ; they produce honey at their base. The stamens are even more numerous than the petals, in several rows, their blunt tips bent over away from the many-celled ovary. The stigma is rayed. The fruit ripens above water, and is, as we have indicated, flagon-shaped ; the seeds are imbedded in pulp. Flowers from June till August.

There is another species :—

The Lesser Yellow Water-lily (*N. pumila*), which occurs in Shropshire and in Scotland, from Elgin to Argyll, but it is rare. Its oblong leaves are divided at the base, the lobes becoming distant from each other. The petals are rounder than in *lutea*, the anthers shorter, and the rays of the stigma reach to the margin, which is lobed.

Water-lilies were dedicated to the Nymphs by the Greeks ; hence the name of the genus.

The White Water-lily (*Castalia alba*), though constituting the British representative of a distinct genus, is closely allied, as, indeed, is the magnificent *Victoria regia* of South American rivers, with leaves 10 to 12 feet across, and flowers 15 inches and more in diameter. *C. alba* opens more widely, and is altogether a more beautiful flower, than *N. lutea*. It has only four sepals, which are green without and white inside, and the petals are without the honey-gland at their base. The round fruit ripens under water, and each seed is invested by a fleshy aril—after the manner of the "mace" around a nutmeg.

1 *Pl.* 30. **Yellow Water-lily.** (p. 34.) *E* 34.

Nymphæa lutea. NYMPHÆACEÆ.

1 *Pl.* 31. **Mouse-ear Chickweed.** (p. 35.) *E* 35.

Cerastium vulgatum. CARYOPHYLLACEÆ.

Mouse-ear Chickweed (*Cerastium vulgatum*).

Mouse-ear is a prefix, not only to this plant, but also to a Hawkweed, and it is Latinized in *Myosotis*. It is really an admirable name, for the leaf of this perennial species has much the shape of the mouse's ear at its upper part, and it is clothed with long silky jointed hairs.

The tyro in botany sees at a glance that this is a member of the Pink family; the straight joints of the spreading stems, thickened where they connect, are sufficient to tell him this. At the joints, or *nodes*, the stalkless leaves are given off in pairs whose bases almost join, and between them encircle the stem. The white flowers are gathered all together at the summit of the stem in clusters called *cymes*, where they ripen in pairs, the footstalk lengthening until it is much longer than the sepals. Under each pair of flowers there is a pair of leaf-like bracts, and the lowest of these are entirely green and opaque; but all the others have a margin of thin, colourless membrane, and the five hairy sepals share this peculiar character. Within, there is a central disc, upon which five glands secrete honey for the temptation of fertilizing insects; and it also supports the stamens, and the curved cylindrical ovary, surmounted in turn by five branched stigmas. The capsule opens at the top by splitting into ten teeth and allowing the dark seeds to escape. It flowers principally from April to August in all kinds of waste places; but its blossoms may be found all through the autumn.

There are seven other British species, the principal ones being:—

I. Erect Mouse-ear C. (*C. quaternellum*). Stems 6 inches or less; smooth and free from hairs, of a glaucous tint. Sepals, petals, stamens, and styles in fours; teeth of capsule, eight. Sepals longer than petals, margins membranous. Gravelly fields, but not in Scotland. May and June.

II. Four-stamened Mouse-ear C. (*C. tetrandrum*) is more frequent on sandy wastes near the sea. Its stems vary from 4 inches to 1 foot, frequently forked. The lower leaves are egg-shaped, tapering upwards; those on the stem broader upwards.

Flowers, ¼ inch, with four sticky sepals, and notched petals. Capsule straight, scarcely longer than sepals. Flowers from April to October.

III. Little Mouse-ear C. (*C. semidecandrum*). A familiar weed in early spring on old walls, and in other dry situations. Stem branched from the base, hairy and sticky (sometimes nearly smooth). Pedicels slightly longer than sepals. Sepals as long again as petals. Bracts and sepals half membranous. Petals appearing as though gnawed. Leaves broader at upper end. Flowers March and April.

IV. Broad-leaved Mouse-ear C. (*C. glomeratum*). Similar to last, but larger. Pedicels *shorter* than sepals. Petals as long as sepals. Sepals with narrow membranous margins. Flowers often imperfectly open, or remain entirely closed, in which case the pollen is discharged directly upon stigmas—the flower being self-fertile. Petals sometimes absent. Bracts not at all membranous. Curved capsules as long again as sepals. Dry places, flowering April to September. All the above are annuals.

V. Field Mouse-ear C. (*C. arvense*). Perennial. Petals as long again as sepals. Pedicels erect. Branches in tufts. Leaves crowded at base. Flowers large, pure white; capsule slightly longer than sepals. Dry sandy places; less common in Scotland. April to August.

Name, Greek, from *keras*, a horn, in allusion to the curved capsules.

Wallflower (*Cheiranthus cheiri*).

This is not a British plant, though it has become firmly established on many old ruins throughout the country. It is a native of Central and Northern Europe, and appears to have been introduced to England about 1573. It is never found growing on rocks in this country, as would be the case were it a native. In some districts it is known as Gillyflower, a name corrupted from the French, *Giroflée de Muraille.* Old writers who use the name Gillyflower refer to the Clove Pink; in the present day the plant usually intended by the term is the Garden Stock. Culpeper calls this Winter Gillyflower. The wild plants are always the single yellow form.

It is a member of the order Cruciferæ, in which all the species have flowers of four petals arranged crosswise. The sepals are very long, stiff, and erect, and for economy's sake that part of the petal that is hidden within the calyx is a weak narrow claw. Honey is secreted by glands on the receptacle at the base of the lateral stamens; and the flower gives off a pleasant fragrance.

1 *Pl.* 32. **Wallflower.** (p. 36.) *E* 36.

Cheiranthus cheiri. CRUCIFERÆ.

1 *Pl.* 33. **Furze.** (p. 37.) *E* 37

Ulex europæus. LEGUMINOSÆ.

The long ovary is surmounted by the two-lobed stigma, and develops into a long pod, 2 or 2½ inches long, containing a large number of reddish seeds. It flowers in May and June chiefly, but also irregularly in mild winters.

It is the only species occurring wild, but in the garden it has produced many grand varieties. The name is most probably derived from the Greek, *cheir*, the hand, and *anthos*, flower—that is, a flower suited by its fragrance to be held as a bouquet.

The Cruciferæ, to which these plants belong, is an important Natural Order, containing five and twenty British genera and a great many species. All are distinguished by the cruciform flowers, by means of which a botanist can distinguish a crucifer at once. Many of our most important garden and kitchen herbs are crucifers, including the majority of our green vegetables and roots, such as cabbage, turnip, radish, mustard, cress, kale, etc.

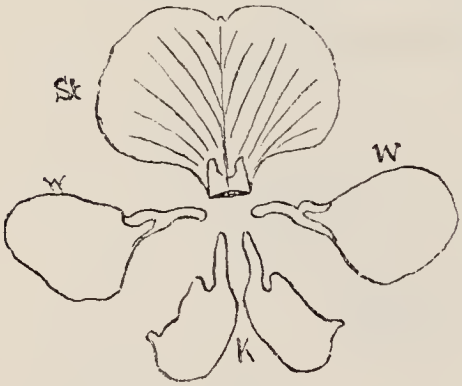
Furze (*Ulex europæus*).

Furze, Whin, or Gorse is so widely distributed and so well known in this country, that a description may be considered superfluous. There are none of our native shrubs that produce so fine a display as the Furze in its proper blooming time. We say "proper" blooming time, because there is truth in the old saw, "When the furze is out of bloom kissing's out of favour," which implies that the plant is always in flower. You can scarcely find a day in the year when a walk through a furze-brake would not be rewarded by the sight of a few of its golden flowers. But it is about April that its full glory is upon the Furze. Then it puts more heart into its blooming, and you may gather enormous trusses of deliciously fragrant flowers—if you are not deterred by the formidable spines. When the Furze is but a seedling it has soft hairy leaves that are trefoils; but as the plant grows older the new leaf-material is produced in the form of spines, with sometimes minute leaflets at their base to show their nature. The larger spines are really branches, as will be seen when the flowers spring from them. Note that in this

genus the calyx, which is divided into two parts only, is large and thin, minutely toothed, and coloured yellow, though this colouring is subdued by the spreading black hairs that cover it. There are large bracts below the flowers. The black, hairy pod is but slightly longer than the calyx, the valves elastic, which causes them when ripe to curl up with a crackling noise, and scatter the polished olive seeds to some distance.

There is a smaller species, the Dwarf Furze (*U. minor*), about half the size of the above, with minute bracts, and the calyx merely covered with fine, close-pressed down, instead of the hairs of *europæus*, but the calyx-teeth are more distinct. The pods, too, do not fly open, but persist on the bush until the season following their formation. Flowers July to November. This species carpets some of our heaths in the south, and makes walking thereon a somewhat painful business, as the branches grow along the ground and their spines attack the ankles. A sub-species of this, known as *U. gallii*, with a more ascending habit and more rigid spines, is common in the west.

The name is said to be derived from the Gaelic, *uile*, all, and *ec*, a sharp point. The genus is included in the order Leguminosæ, in which we find a great departure from the ordinary arrangement of the floral organs, though the order is very regular in its irregularity. The accompanying diagram of a dissected pea-flower may make clearer future references to Leguminous plants. St, the largest and uppermost petal, is known as the Standard ; W, W,



Parts of a leguminous flower.

1 *Pl.* 34. **Tamarisk.** (p. 39.) *E* 38.

Tamarix gallica. TAMARICACEÆ.

1 *Pl.* 35. **Corn Spurrey.** (p. 39.) *E* 39.

Spergula arvensis. CARYOPHYLLACEÆ.

the lateral pair, are the Wings ; and K, the lower pair, combine to form the Keel in which the stamens and pistil lie.

Tamarisk (*Tamarix gallica*).

Visitors to seaside places on the south, east, and west of England will constantly meet with a small tree or bush, 10 or 12 feet high, with pliant feathery branches and minute evergreen leaves, which are triangular with keeled backs and eared bases, closely overlapping and appearing to be mere scales. This is the Tamarisk, a tree that is not a native, but which has been grown in Southern England for so long that it has come to be considered as an indigene. Its great recommendation is the power to withstand cutting salt winds, that destroy the foliage and branches of many perfectly hardy shrubs, and as it is readily propagated by cuttings it has become extensively used as a hedge for seaside gardens in the localities indicated. Its flowers are minute, white or pale rose, about $\frac{1}{8}$ inch in diameter, but clustered in a blunt spike $1\frac{1}{2}$ inch long. They consist of four or five lance-shaped sepals, a similar number of petals, and a tapering ovary, with three or four short, thick styles. It flowers from July on, as late as November in mild districts. The fruit is triangular in section. Several other species may be found in gardens and greenhouses, but this is the only one that has any semblance of wildness in this country.

The name is said to be derived from Tamaris, a Spanish river on whose shores the tree is plentiful.

Corn Spurrey (*Spergula arvensis*).

The Spurrey is one of that extensive tribe of weeds of many orders that hang, so to speak, upon the heels of the farmer, and follow wherever he goes. This one will be most readily found

in the cornfield on dry soils, about June, when the corn has not grown too high nor too bushy in the head to prevent one from seeing a little between the straight ranks. It represents another genus of the Pink Order, and may possibly be put down as a species of *Cerastium;* but *Cerastium* has notched petals, whilst those of *Spergula* are entire. It has straggling, downy stems, branching from the root, from 1 to 2 feet in length, with bent joints, or knees. The leaves are half round, awl-shaped, very slender, in distant pairs, but from their association with newer leaves springing from their axils, they appear to be arranged in whorls. The flowers are minute, gathered into cymes at the ends of the stems. Now, as these flowers have footstalks of varying lengths which bring them all to the same level, on the principle of the umbel, the flower-group is said to be an umbellate cyme, or rather sub-umbellate cyme, because the umbel likeness is not very complete owing to those flowers that have set their seeds bending down by the depression of their footstalks. They are habitually self-fertilized—which is sufficient explanation of the small and inconspicuous blossoms. The five sepals are oval, almost as large as the five white petals. Stamens ten, with roundish anthers ; ovary egg-shaped, with five curved styles. It flowers from June to August. This is the only native species.

The name of the genus is from the Latin, *spargo*, to scatter or sow, from its habit of turning its capsules upside-down to disperse the ripe seeds.

Tall Melilot (*Melilotus altissima*).

In field corners, bushy hedgerows, and roadside wastes, the rambler comes across an erect, slender, branching plant with few trefoil leaves and many long-stalked sprays of small Furze-like yellow flowers. This will be one of the Melilots ; but of

the three species found in this country two have yellow flowers; and until they have ripened their seed-pods it is difficult to say whether you have the native *M. altissima* or the alien *M. officinalis*. If the two could be examined side by side, it would be seen that the flowers of the first-named are of a deeper yellow than those of the other.

Tall Melilot is three or four feet high, with distant long-stalked leaves broken up into three slender oval leaflets with toothed edges: at the base of the stalk is a pair of bristle-like stipules. From the axils of the leaf-stalks stand out the long flowering branches, bearing many flowers, all drooping and turning in one direction. The petals are all of the same length. The flattened, hairy pod has net-like markings, and when ripe is black. Flowers, June to August.

Common Melilot (*M. officinalis*), found chiefly in the eastern counties, differs in the paler tint of its flowers, with the keel shorter than the other petals; stipules awl-shaped; the stouter, smooth pod brown or olive. Flowers, June to August.

White Melilot (*M. alba*) is a rare alien, found on sandy wastes near the sea. Its smaller white flowers (July and August) have the standard longer than the other petals. Smooth oval pod, black when ripe.

The name is a compound of *mel*, honey, and *lotus*, the name of another genus = the Lotus with the honeyed odour.

Wood Sorrel (*Oxalis acetosella*).

One of the most graceful and charming of native plants. It abounds in moist shady woods, rapidly covering the leaf-mould with its fresh yellow-green trefoils backed with purple, and pink-streaked white flowers. In such a situation in April or May it produces beautiful effects. A favourite position for it is the rotten centre of some old beech stump, from which it will spread in a loose cluster, "covering with strange and tender honour the scarred disgrace of ruin," as Ruskin says of the lichens. But in some woods it may be found in great abundance on the

ground, co-operating with Primrose and Anemone in forming a continuous carpet of exquisite flowers. Whatever the summer may do for us in its lavish displays of broad acres of snowy Ox-eyes, golden Buttercups, or blazing Poppies, it cannot compete with the charm and delicate beauty of the spring woodland.

The roots are fine and scattered along the creeping knotted pink stems. The leaflets droop close to the stalk at night or on the approach of rain. The flower is regular; sepals five, petals five, stamens ten, stigmas five. The fruit is a five-angled, irritable capsule, from which the seeds are thrown with great force to a distance of several yards. In addition to the coloured spring flowers the Wood Sorrel produces throughout the summer a large number of buds which never open (*cleistogamic*), but which develop into seed-vessels and discharge good seeds. The leaves have a pleasant acid flavour, due to the presence of oxalic acid. The generic name refers to this fact, and is derived from the Greek *Oxys*, sharp.

The Wood Sorrel is a sensitive plant. The leaves contract or expand their leaflets under the influence of darkness or light respectively, and a slight jar to the stem will cause the capsule to discharge its seeds with considerable force.

This is the only truly native species; but two others, standing about a foot high, and with *yellow* flowers, have become naturalized in the south-west of England. These are:—

Procumbent Wood-sorrel (*O. corniculata*), with much-branched stalk; both stalk and branches soon becoming procumbent; and the flowers borne two or three on one peduncle. Leaves and stalks bronzed. Flowers June to September.

Upright Yellow Wood-sorrel (*O. stricta*), similar to the last, but with stem more erect; flowers two to eight on one peduncle.

The genus *Oxalis* is included in the Geraniaceæ.

Broom (*Cytisus scoparius*).

The Broom is sadly liable to be confounded with the Furze by the non-botanical rambler, chiefly, we believe, because of

1 *Pl.* 36. **Tall Melilot.** (p. 40.) *E* 42.

Melilotus altissima. LEGUMINOSÆ.

1 *Pl.* 37. **Wood Sorrel.** (p. 41.) *E* 43.

Oxalis acetosella. GERANIACEÆ.

a kind of similarity in the flowers, and the partiality of both for heaths and commons. There are, however, several points of difference between them; but one is sufficient for a rough-and-ready distinction. The Furze began life with a few leaves similar to those of the Broom, but as it grew it put forth sharp spines instead of ordinary leaves, until it became more difficult to handle than any hedgehog. The Broom rarely puts on any prickles at all, and its compound leaves, of three small leaflets, may be seen as in the plate, close to the pliant stems.

The flowers, too, are larger than those of the Furze, though similar in structure. The calyx is two-lipped, the petals five, unequal in size and shape. The very large upper petal erects itself somewhat, and is known as the "standard." The two lateral ones are called "wings," and the lower pair are united all along their lower edges, to form a boat-shaped body, called the "keel." (See accompanying diagram of a flower with the petals of one side removed.) In this keel lie the stamens and pistil, which are curved, and the former have the filaments united into a tube within which lies the ovary. The stamens also vary in length, and should a bee alight on a newly opened blossom in quest of pollen—for the Broom produces no honey—the pressure of the "wings" upon the "keel" forces out the shorter stamens, and they dust the bee's abdomen with pollen. Should, however, the insect visit a flower lower down the stem, and consequently a day or two older, the long stamens and the pistil spring out with some force, and the hairs on the pistil brush out the shed-pollen from the "keel" and sprinkle it on

Section of Broom flower.

the bee's back. Then the pistil curls so that the stigmatic surface shall come in contact with the abdomen of the next bee that arrives, probably with pollen from another flower. Thus fertilized, the ovary develops into a valved pod like that of the garden pea, but smaller, of course, and black. (Shown at side of Plate 38.) When ripe the valves separate, twist up, and scatter the seeds. Press down the wings with the finger in the position a bee would occupy, and observe the action of this remarkable mechanism, which, with variations, is common to all Leguminous plants. The Broom flowers from April to June, and is widely distributed throughout the kingdom.

Cytisus scoparius is our only native species.

Sweet Violet (*Viola odorata*).

One of the most valued flowers of spring in cities is the cultivated violet, and the rambler from town considers himself fortunate if he comes upon a sheltered bank whereon the wild Sweet Violets grow. We need not dwell at any length upon the special characters of this species, for its possession of sweet perfume is sufficient alone to separate it from the related species comprised in the genus *Viola.*

It will be seen to have a short rootstock, and to give off runners. The leaves are broadly heart-shaped, and have a way of enlarging greatly after the plant has flowered—a characteristic shared by the Marsh Violet and the Hairy Violet. The flowers vary in colour; they may be blue, reddish-purple, or white. The petals are unequal in size and shape, there being two pairs and an odd one. This is larger than the others, and is produced backwards as a short hollow spur. It is really the uppermost of the five petals, but, owing to the flower-stalk (*peduncle*) invariably bending over near the summit, it appears to us always as the lowest.

1 *Pl.* 38. **Broom.** (p. 42.) *E* 44.

Cytisus scoparius. LEGUMINOSÆ.

1 *Pl.* 39. **Sweet Violet.** (p. 44.) *E* 45.
Viola odorata. VIOLACEÆ.

A careful examination of the form and mechanism of the essential organs of this genus will be well repaid by the light thrown upon Nature's methods to secure the continuity of species. The style on arising from the ovary is thin and bent, but gradually expands until the stigmatic surface is very broad in comparison. The stamens surround the style, the anthers so closely touching each other laterally that they enclose a space in which the ovary and style occupy the centre, and from which the stigma protrudes. The anthers shed their pollen, which is *dry*, into this space. Two of the stamens send out each a long tail into the hollow petal-spur, which secretes honey from its tip. The reason why the flower-stalk bends over is, that the stigma may hang down instead of being erect. A bee smells the honey and alights on the odd petal. The dark lines converging to the spur show where the honey lies, but the thick-headed stigma blocks the way. Thrusting in his tongue, the bee pushes the stigma aside with his head, which is the more easily accomplished owing to the thin base of the style. But this act also disarranges the anthers, and as a result the loose pollen drops out upon his hairy head, where it will come in contact with the viscid stigma of the next violet he visits. In this way an occasional cross is effected that the vigour of the race may be maintained, but for ordinary purposes of reproduction the violet has a more economical method. When the spring season is over the violet ceases to furnish flowers got up for show, and sets about producing buds which will never open (*cleistogamic*). These are without petals, and contain nothing but the essential organs; the anthers produce only enough pollen to fertilize the ovules in the ovary, which then develop into perfect seeds.

Viola odorata is found truly wild only in the south and east of England, and possibly the east of Ireland; but it is naturalized in many other parts of the kingdom. Flowers March to May. The name *Viola* is Latin, and is that by which the ancients

knew it. There are six other British species, which will be found enumerated under Wild Pansy (page 49).

Viola is our only genus of the order Violaceæ.

Needle Whin (*Genista anglica*).

Needle Whin is in some districts Needle-furze, Needle-Greenweed, or Petty-whin, the proper Whin being the Furze, described on page 37. It is a prickly, shrubby plant, with bright yellow blossoms, that grows freely on heaths and moors throughout the country. The slender branches spread in all directions, covered with spines and minute lance-shaped leaves. The spines vary from ½ to 1 inch in length, and occasionally may be found branched. The flowers, which spring from the axils of the bract-leaves, are about ½ inch long, have short footstalks, and are of the usual Pea type of structure, by which all the members of the order Leguminosæ are distinguished. The significance of this type of structure will be found fully explained under the head of Broom (page 42). The calyx is two-lipped, the upper one cut into two lobes, the lower shorter, with three short triangular teeth. The filaments of the stamens are all united to form a tube, and the anthers are alternately long and short. The seed-pod is inflated, about ¾ inch long, and pointed at each end. It flowers in May and June.

The other British species are two :—

I. Dyers' Greenweed, or Woadwaxen (*G. tinctoria*). Formerly of importance in the production of Kendal Green. Stems rigid, branched, but without spines. Leaves rather distant, with hairy edges, and awl-shaped stipules. Flowers pale yellow, almost stalkless. Pod, 1 inch or more long, thin, smooth. Pastures, meadows, and thickets on poor soil. July to September.

II. Hairy Greenweed (*G. pilosa*). A rare plant, not extending north of a line drawn from Suffolk to South Wales. Small, with many tortuous branches, and small yellow flowers. The leaves silky beneath. Pod, ⅜ inch, thin, downy. Gravelly heaths. May to September.

Name said to be from the Celtic, *gen*, a shrub.

1 *Pl.* 40. **Needle-whin.** (p. 46.) *E* 46.

Genista anglica. LEGUMINOSÆ.

1 *Pl.* 41. **Horned Poppy.** (p. 47.) *E* 47.

Glaucium flavum. PAPAVERACEÆ.

Horned Poppy (*Glaucium flavum*).

Although this yellow Horned Poppy is separated by botanists from the genus that includes the Corn Poppy and others, it is included in the order Papaveraceæ ; and those who do not call themselves botanists, yet love flowers, can tell almost at a glance that it and the true Poppies are related not very distantly. It is a plant of sandy seashores, where it forms one of the most striking items of the vegetation. Though only an annual plant (occasionally perennial), it contrives to flower for about five months. Its branching stems spread in all directions, and the blue-green, roughish leaves are large and boldly lobed and cut, clasping the smooth stem by their bases. Like the leaves of most shore plants, they are thick and leathery in character. The bright yellow flowers are 3 or 4 inches across. The two concave sepals are thrown off when the flower opens, just as in *Papaver ;* and the four golden-yellow petals form two pairs, one larger than the other. The ovary is long and narrow, the two-lobed stigma stalkless. The ovary develops into a long, two-valved pod, from 6 inches to 1 foot in length. The petals, like those of the Poppy, are crumpled in the bud, and soon fall off after they have become properly expanded. The plant attains a height of 2 feet. It is the only British species, and does not occur in Scotland north of the Forth and Clyde. Flowers June to October.

The name is from the Greek, *glaukos*, blue, in allusion to the blueness of its green ; and possibly in remembrance of that Bœotian fisherman who became a sea deity.

Common Red Poppy (*Papaver rhœas*).

(*See Frontispiece.*)

The Poppy is one of those plants concerning which it may be thought that neither illustration nor description is necessary ;

but there are poppies and poppies; and though the rambler may gather a bunch of flowers from various situations and consider them all the same, a few words of description may serve to point out considerable differences.

Through the Horned Poppy we made acquaintance with the Papaveraceæ, and now we deal with its typical genus, *Papaver*. The plants comprised in the genus are all annual herbs, with milky juice of a narcotic nature. The flowers are borne on very long and slender stalks, and consist of two concave sepals, which are thrown off by the expanding of the four crumpled petals. The pistil, which afterwards develops into the familiar "poppy-head," is surmounted by the many stigmas which form a rayed disk.

There are four native members of the genus :—

I. The Common Poppy (*P. rhœas*), which is so unpleasantly abundant in cornfields south of the Tay, has branched bristly stems and pinnate leaves, the points of the lobes directed upward and ending each in a bristle. The bristles on the flower-stalks stand out at right angles, or nearly so. This is an important character. The glorious scarlet flowers are large (3 or 4 inches in diameter), the petals in two unequal pairs. Rays of stigma, eight to twelve. Capsule smooth and short, slightly stalked above the receptacle. Flowers June to September.

II. Round Rough-headed Poppy (*P. hybridum*). Leaves only slightly bristly. Flower small (1 to 2 inches), scarlet, with *a black patch* at the base of each petal. Stigmatic rays, four to eight. Capsule more globose than the preceding species. Dry sandy and chalky fields south of Durham and Carnarvon. May to July.

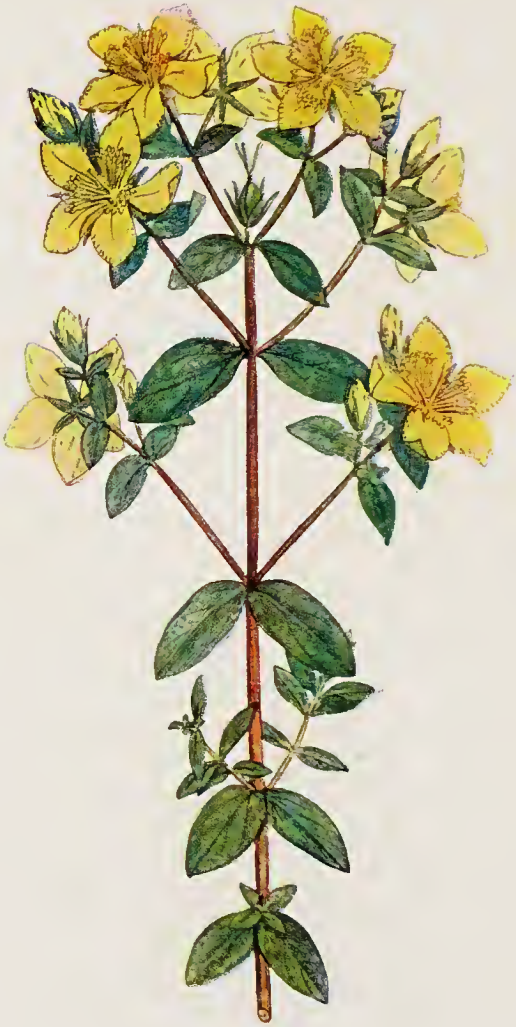
III. Long Prickly-headed Poppy (*P. argemone*). Similar to the last, but smaller and weaker in all respects—in fact, our smallest species. Petals narrow and paler in colour. Capsule *bristly, club-shaped.* Stigmatic rays, four to six. Cornfields. May to August.

IV. Long Smooth-headed Poppy (*P. dubium*). Similar to *P. rhœas*, but the bristles are pressed against the stalk upwards. Flowers large, petals broad, but in unequal pairs, light scarlet. Stigmatic rays, six to twelve. Capsule *slender, smooth*, tapering downwards, not stalked above receptacle. Cornfields. May to August. There is a sub-species (*P. lecoqii*) of this, with longer leaf-lobes and deflexed lobes to the stigmas. The sap, too, turns yellow on exposure to the air, whilst that of the typical form remains white. This form is rare.

The Opium Poppy (*P. somniferum*), with glaucous foliage, and flowers varying from blue-purple to white, is plentiful in some localities. It is not a native, but an escape from cultivation.

1 *Pl.* 42. **Wild Pansy.** (p. 49.) *E* 48.

Viola tricolor. VIOLACEÆ.



1 Pl. 43. **Perforated St. John's Wort.** (p. 49.) *F* 49.
Hypericum perforatum. HYPERICACEÆ.

Wild Pansy or Heartsease (*Viola tricolor*).

The Pansy differs from all the other species of *Viola* in the fact that the two upper petals are very erect instead of leaning forward, and in the stipules being developed into large leaf-like organs. In addition, this species produces none of the *cleistogamic* flowers. The leaves, too, assume forms very different from those of the typical species. The flowers vary from white, through yellow to purple, or there may be a mixture of two or more of these tints. They grow in pastures and the waste corners of various fields, flowering from May to September, and are generally distributed. A sub-species of this (*V. lutea*) has larger flowers, and underground runners. It occurs only in the fields on mountain-sides. The other species of the genus are :—

I. Marsh Violet (*V. palustris*). Growing among *Sphagnum* in bogs. Leaves rounder than *V. odorata*, firm and shining. Flowers lilac or white, purple-veined, scentless, and with short blunt spur. April to July.

II. Hairy Violet (*V. hirta*). Similar to *V. odorata*, but more compact, more hairy, the leaves narrower and more deeply toothed ; spur *long*, *hooked*. Purple, blue, or white. Odour slight or wholly wanting. A local species occurring in dry soils, and abundant on chalk-downs from April to June.

III. Dog Violet (*V. canina*). Rootstock produced into a distinct stem, bearing flowers. Sepals narrow, pointed. Leaves *not* enlarging after flowering, as do those of *V. odorata*, *palustris*, and *hirta* ; on long footstalks. Plant more or less smooth. Flowers from April to August, on banks everywhere.

IV. Wood Violet (*V. sylvestris*). Plant smooth. Central rootstock short, with a rosette of leaves, from which branches are given off all round. From these branches only are flowers produced. Spur short and broad. Leaves broad. Copses and woods. March to July. Often closely resembling *V. canina*, of which it may be only a variety.

V. Sand Violet (*V. rupestris*). A very rare, compact, hairy plant. Leaves much rounder than the preceding. Petals broad, pale blue. Spur short. Recorded from Upper Teesdale and Westmoreland only ; flowering in May and June.

Perforated St. John's Wort (*Hypericum perforatum*).

There are no less than eleven native species of St. John's Wort, all characterized by a neat habit, clean-cut leaves without stalks,

yellow flowers in cymose clusters, and a multitude of stamens, which are more or less joined in several bundles.

The species represented on our plate is one of the commonest, and occurs in copses and hedgebanks throughout the kingdom, as far north as Sunderland, flowering from July to September. It is very erect in habit, the stems two-edged, pale brown and smooth, 2 or 3 feet high. If the leaves are held up to the light it will be found that the veins (*but not the reticulations*) are pellucid, and that the leaf is thickly dotted with pellucid glands. The flowers are 1 to 1¼ inch in diameter. The calyx, corolla, and sometimes leaves are more or less marked with black dots and lines. The sepals and petals are each five in number; the ovary large, pear-shaped, surmounted by three long styles, which are longer than the ovary. The stamens joined in three bundles by their bases only. Sepals glandular.

Among the other British species are:—

I. Square-stalked St. John's Wort (*H. tetrapterum*) Stem with four narrow wings, 1 to 2 feet, leaves broader than in *perforatum*, but the glands, veins, *and reticulations* are pellucid. Styles shorter than the ovary. Flowers dense, ½ to ¾ inch across. Moist places, July and August.

II. Trailing St. John's Wort (*H. humifusum*). Stems slender, compressed, prostrate, not exceeding 1 foot. Leaves small, oblong; glands pellucid; the margins are often marked with black glands, and are sometimes rolled back. Flowers, ½ inch across. Sepals unequal. Styles very short. Commons and wastes. July and August.

III. Small Upright St. John's Wort (*H. pulchrum*). Stems slender, round, smooth, erect. Leaves heart-shaped, with pellucid glands. Sepals small, oblong, with black glandular teeth. Petals yellow, tinged with red, and edged with black glands. Styles short; anthers red. Flowers ¾ inch, in loose panicles. Dry woods and heaths. June and July.

IV. Hairy St. John's Wort (*H. hirsutum*). Stem erect, round, downy. Leaves large, *with short stalks*, downy beneath, pellucid glands. Sepals very narrow, half length of petals, with black glandular teeth. Woods and thickets, especially on chalk. July and August.

V. Tutsan (*H. androsæmum*). Stem shrubby, compressed, 2 feet high. Flowers few, ¾ inch across. Sepals unequal (three large, two small), glandular, except margin. Petals and stamens not permanent. Stamens in five bundles. Styles shorter than stamens. Hedges and thickets. July to September.

The Rose of Sharon (*H. calycinum*), with flowers 3 inches across, and large leathery leaves, is an introduced species from South-East Europe, largely grown in shrubberies and coverts, which has established itself in many open places, as on Ranmore Common, Surrey.

1 *Pl.* 44. **Rest-harrow.** (p. 51.) *F* 50.

Ononis spinosa. LEGUMINOSÆ.

1 *Pl.* 45. **Kidney Vetch.** (p. 52.) *F* 51.

Anthyllis vulneraria. LEGUMINOSÆ.

Rest-Harrow (*Ononis spinosa*).

The Rest-Harrow or Wrest-Harrow is one of those plants whose presence in the pasture is said to indicate its poverty or the neglect of the cultivator. In Sussex and Hampshire it is known as the Cammock. It is a perennial low shrub, sometimes creeping near the ground, and at others growing more erect. The rootstock often creeps underground, a habit to which the plant owes its popular name, as it is said to be so tough as to *wrest* the harrow from the even tenor of its way. The more prostrate form (sub-species *O. repens*) is covered with viscid hairs; the more erect-growing plants are spiny. In the latter condition it is said that only donkeys will eat it, and hence its scientific name *ononis*, from *onos*, an ass, but it is open to question whether the ass has any fondness for it if he can get other food. The flowers are similar in structure to those of Broom, and may be borne either singly or in racemes. They are pink in colour; the petal known as the standard is very large in this species, and streaked with a fuller red. The pod is very small, and in the hairy form is not so long as the calyx. The flower does not secrete honey, but in spite of this fact, it seems to be chiefly if not exclusively fertilized by bees, who are evidently fooled by its resemblance to other flowers of the same form that do offer refreshment to insect visitors. The worker-bees, however, get pollen for their pains, but the males are sadly disappointed. Rest-Harrow will be found flowering in dry wastes from June to September.

There is another species, the Small Rest-Harrow (*O. reclinata*), a rare annual with spreading hairy, viscid stems, only a few inches in length, stalked rosy flowers not half the size of *spinosa*, and a hairy pod as long as the calyx, or longer. It is exceedingly local, and has only been reported as occurring on sandy cliffs in Devon, Wigton, and Alderney. Flowering in June and July.

Kidney Vetch (*Anthyllis vulneraria*).

The Kidney Vetch or Lady's-fingers was celebrated from early times as a plant that was efficacious in the cure of wounds, and hence its specific name *vulneraria.* There is no doubt that this reputation was well-founded, for its bluish leaves are covered with silky hairs and its calyces downy, and these could be used for stanching blood. It is a perennial herb that affects dry pastures and rocky banks. From a woody rootstock arise several stems and a large number of radical leaves ; these consist of a long terminal leaflet and two disproportionately small lateral leaflets. The leaves from the stems (cauline leaves) have a larger number of leaflets in pairs, as well as a terminal one. The flowers are borne in heads, with an involucre of leaflets, and the heads are chiefly in pairs. The calyx is membranous, and therefore permanent, the mouth oblique, with five teeth. The petals are nearly equal in length, and typically yellow, but subject to considerable variation. After flowering the straw-coloured calyx becomes inflated, and the roundish smooth and veined pod with its solitary seed is hidden within. In some of the coast localities for this plant it will be found with flowers white, cream-coloured, crimson, and purple ; this has been especially noted at the Lizard in Cornwall. It is ordinarily in flower from June to August. This is the only British species.

The name is the one in use among the ancient Greeks, and signifies *bearded flower*, which is obviously a reference to the woolly calyces.

Corn Cockle (*Githago segetum*).

Wandering through or round the cornfields any time from June to September we are almost sure to find this beautiful flower. It is first cousin to the Lychnis, already described, and

1 *Pl.* 46. **Corn Cockle.** (p. 52.) *F* 52.

Githago segetum. CARYOPHYLLACEÆ.

1 *Pl.* 47. **Yellow Pea.** (p. 53.) *F* 53.

Lathyrus pratensis. LEGUMINOSÆ.

in general structure agrees with it, only differing from it in having a leathery calyx, and in the absence of the crown of little scales which surrounds the mouth of the corolla-tube in Lychnis. The flowers produce honey, but owing to the length of the tube it is only accessible to the long tongues of butterflies and moths, who are instrumental in effecting its cross-fertilization. The plant is an annual, with erect stem, clothed with white hairs, and attaining a height of 4 or 5 feet. The leaves are long and narrow, 4 or 5 inches long, and not unlike the leaves of the corn-plants surrounding them. The woolly calyx is in one, strongly ribbed, with five very long leaf-like teeth, that considerably exceed the petals in length. The flowers are solitary, of a rich purple within, much paler without, and measure nearly 2 inches across.

This is the only native species ; indeed, some writers consider it to be only an introduced plant—a form of *Agrostemma gracilis* that has been altered by its continuous growth in our cultivated fields.

Yellow Pea (*Lathyrus pratensis*).

The Yellow Pea or Meadow Vetchling is a very near relation of the garden Everlasting Pea, and an examination will show that they closely resemble each other in most points except size and colour. The Yellow Pea has a creeping underground root-stock from which arise several sharp-angled stems. The leaves are each divided into two lance-shaped leaflets, with, in most cases, a short tendril springing between them. At the junction of each leaf-stalk with the stem there is a pair of very large stipules, of the arrowhead type, and broader than the leaflets. The small, bright yellow flowers are borne in bunches (*racemes*) of about a dozen, supported by a stalk an inch or more in length. The calyx is tubular, with five long awl-shaped points,

and the large erect petal, called the standard, is marked with several sharp thin purple streaks. It may occur to the rambler to query what difference separates this plant from the Vetches, that it should be included in a separate genus; and we may reply that the differences are not great. In habit *Lathyrus* and *Vicia* are very similar, but *Lathyrus* has fewer leaflets and broader petals. In addition, there is a minute distinction based on the tube formed by the cohesion of the lower portions of the stamens; in *Vicia* this ends abruptly, but in *Lathyrus* it is cut, as it were, on the slant. The style, too, is flattened, and its inner surface bearded. The plant is fairly common in meadow and copse, also on the hedge-banks, throughout the country, and may be found in flower from June till September.

There are eight other British species, of which four that are most closely allied to the Yellow Pea are briefly described below, whilst others will be found with the Grass Pea on page 75.

I. Rough-podded Pea (*L. hirsutus*). A very rare annual, which has been found in cultivated fields in Surrey, Kent, Essex, and Yorks. It has an angled and winged stem (2 to 4 feet), with scattered leaves divided into a pair of narrow lance-shaped leaflets, and branched tendrils. The flowers, from one to three in a cluster, have crimson standards and paler purplish wings. June and July. The pod is rough with little tubercles, and covered with dense silky hairs.

II. Narrow-leaved Everlasting Pea (*L. sylvestris*). A local perennial with winged stems which climb in thickets to a height of 6 feet. The leaflets are very long and sword-shaped, whilst the stipules are sickle-shaped with lance-shaped ears. There are from three to ten flowers in a raceme, and these have purplish wings with a rosy standard. June to August. The stems and leaves are of a glaucous green.

III. Marsh Pea (*L. palustris*). Another local perennial of glaucous hue, with winged stem (4 feet), and the leaves divided into two or three pairs of sword-shaped leaflets, with half-arrow-shaped stipules. The flowers (two to six in a raceme) are pale-blue purple, and appear from June to August in boggy meadows and wet copses, from Yorks and Carnarvon to Suffolk and Somerset.

IV. Seaside Pea (*L. maritimus*). Perennial of pebbly shores on the east and south coasts from Shetland to Kent and Dorset. It has an angular stem, not winged, about 3 feet long, which creeps prostrate over the stones and clings to them with its short tendrils. There are from three to five pairs of oblong leaflets, smooth and glaucous; and the stipules are half-halberd-shaped. Flowers, five to ten in a raceme, purple, turning blue as they fade. June to August.

The genus is named from *Lathuros*, the Greek name of a plant mentioned by Theophrastus.

1 *Pl.* 48. **Common Flax.** (p. 55.) *F* 54.

Linum usitatissimum. LINACEÆ.

1 *Pl.* 49. **Barren Strawberry.** (p. 56.) *F* 55.

Potentilla fragariastrum. ROSACEÆ.

Common Flax (*Linum usitatissimum*).

Occasionally the rambler will find this Flax in cornfields and wastes, by oil-mills and in the neighbourhood of railway stations. Wherever it may be found it is an escape from cultivation. As a truly wild plant the " most used " flax is not known : in cultivation, as the parent of linen garments, it has been known from the infancy of the human race. To-day the exports of flax and linen from the United Kingdom are worth about £7,500,000 per annum. It is therefore a plant that would be entitled to respectful consideration when we meet with it, even if it had no grace or beauty to commend it to us.

Common Flax is an annual plant, with erect slender stems about 1½ feet high. Its narrow lance-shaped leaves are arranged alternately and at a distance from each other. The flowers are large, and purplish-blue in colour. Five is the number dominating the structure of the flower : sepals, petals, stamens, glands, ovary (five cells), styles—all in fives. It flowers in June and July.

There are three species that are truly wild in Britain :—

I. Purging Flax (*L. catharticum*). A smaller species, ¼ foot high, with *white* flowers, affecting heaths and pastures. It has opposite, very narrow leaves, and the unopened buds nod. Flowers June to September.

II. Perennial Flax (*L. perenne*). A very rare perennial plant with exceedingly narrow leaves, alternate on the numerous wiry stems. Plant about 2 feet high. The large bright-blue flowers, which may be found from June to September, are of two forms, long-styled and short-styled, like the Purple Loosestrife (see page 106), and for a similar purpose. On chalky soils from Durham to Essex.

III. Narrow-leaved Flax (*L. angustifolium*). Leaves alternate, as narrow as in the last species, but smaller and not so plentiful. Flowers smaller and paler, petals smaller in proportion to the calyx. Flowers May to September. Sandy and chalky pastures, not farther north than Lancashire.

The genus *Linum* belongs to the small natural order Linaceæ, whose only other British representative is a tiny annual called Flax-seed or All-seed (*Radiola linoides*), which grows in moist sandy places, with minute leaves and more minute white flowers.

Linum is the ancient Latin name for the plant and its products.

Barren Strawberry (*Potentilla fragariastrum*).

The Barren Strawberry is one of the earliest of the flowering plants to make its presence known on dry banks under shelter of the hedge. Those who have not given a fair amount of attention to our wild flowers accept it at once as the true Wild Strawberry, its second cousin, the resemblance of leaf and flower being sufficiently close.

The Barren Strawberry (*P. fragariastrum*) has a branching rootstock, with a tuft of *silky* radical leaves and hairy stalks. The leaves of the Wild Strawberry have deeply sunken nerve-lines, whilst those of *Potentilla* have the upper surface free from such grooving. The petals in the present species are notched. The long runners, too, of the Strawberry, with the young plants attached, are another sufficient distinction during the flowering season; but when the fruit is well formed there is no need for consideration of the differences we have named. Instead of the receptacle swelling up, becoming juicy and red as in *the* Strawberry, we have in the barren counterfeit a mere cluster of dry achenes that would tempt neither eye nor palate. Flowers spring. Other species of this genus are :—

I. Spring Cinquefoil (*P. verna*). A somewhat hairy, local plant, with prostrate stem, the leaves with five to seven oval leaflets, with rounded teeth towards the tips, and arranged finger-fashion (*digitate*); flowers few, yellow, ½ inch in diameter, April to June.

II. Orange Cinquefoil (*P. rubens*). Similar to *P. verna* (of which it may be a variety), but distinguished by its ascending stems, its larger leaflets, and larger (1 inch) flowers, which appear in June and July. It is a local species growing on alpine rocks from Wales and Yorkshire northwards. It is variously known as *P. rubens*, *P. salisburgensis*, *P. maculata*, *P. aurea*, *P. alpestris*.

III. White-leaved Cinquefoil (*P. argentea*). Rootstock short, woody; leaves stalked, digitate with five narrow wedge-shaped leaflets, white and woolly beneath, and margins curled back; stems branched, leafy, 6 to 18 inches, half erect or recumbent. Flowers, ¼ inch or less across, yellow, June and July. Dry pastures and roadsides, local.

IV. Marsh Cinquefoil (*P. palustris*). Rootstock long, woody; stems 6 to 18 inches, purple; leaves pinnate, with five or seven narrow, coarsely toothed leaflets; flowers few, petals five, small, dark purple. Fruit like a strawberry, many achenes

supported on a large, spongy, crimson receptacle, dry and persistent; ornamental. Flowers June and July, in bogs and marshes.

Other species will be found described on the next page, and page 70. The genus is included in the order Rosaceæ, and its name is from the Latin *potens*, having reference to the powerful medicinal properties formerly believed to be possessed by certain species.

Cinquefoil (*Potentilla reptans*).

On grasslands and roadside wastes, pretty well all over the country, one may find the neat leaves and long slender creeping stems of the Cinquefoil, and from June to September it may be passed over as one of the Buttercup family, owing to its golden flowers, though these are not really cup-shaped. It was our lot a few years since to contrive a garden out of a plot of old pasture, and though we found the soil plentifully stocked with roots and seeds of a large assortment of vigorous weeds, two especially gave us a vast amount of healthy exercise. The two were Couch-grass (*Agropyron repens*) and Cinquefoil. The latter has woody rootstocks which extend for a foot or more in the soil, black without and red within, and at their upper end these branch and form several crowns. From each of these crowns run off in all directions slender stems, yards in length (though the botany books modestly set them down as about a foot), clothed at intervals with long-stalked beautiful leaves. These leaves are broken up into five toothed and egg-shaped leaflets, arranged finger-fashion (*digitate*). Also at frequent intervals, from the underside of the stem, fine roots are driven into the soil to peg the stems down. The stems from numbers of these plants cross and recross until they cover the earth with an extensive network that runs through the tufts of garden plants, and makes all gardening operations well-nigh impossible until the soil has been thoroughly cleaned by laboriously picking out every scrap.

The five petals alternate with the green sepals, which show between them, producing a pretty effect. The flowers are about

1 inch across, and arise singly on slender stalks from the axils of the leaves. Below the sepals there is a set of little bracts (*bracteoles*), which present an appearance of the calyx being double. These bracteoles, indeed, are collectively spoken of as the *epicalyx*. The stamens and pistils ripen simultaneously, and the flowers are visited by a great number of insects, including flies, beetles, bees, and butterflies.

A closely allied species is :—

I. Tormentil (*P. tormentilla*), which might be called a smaller edition of Cinquefoil, so similar is it. But in several points this species differs from its congener, thus—in the typical form the stem is wholly or partially erect, and rarely roots; the stem-leaves are not stalked, the leaflets are three instead of five, its petals four, and its flowers, which are not solitary, are about one-fourth less in diameter, whilst the bracteoles are much more slender than the sepals. It should be stated, however, that occasionally it may be found with five leaflets, or with five petals. It affects drier situations than the Cinquefoil likes. There is a sub-species—by some regarded as a distinct species—

II. Creeping Tormentil (*P. procumbens*), in which the stem creeps, the stem-leaves are often stalked, and the five-petalled flowers are few or solitary.

For other species of *Potentilla*, see pages 56 and 70.

Dove's-foot (*Geranium molle*).

This neat member of a charming family is a familiar plant of the wayside and pasture, flowering from May to September. The stems are slight, and swollen at the joints. The leaf-stalks are long, and the leaves, though their general outline is kidney-shaped, are deeply cut into about seven lobes, which are in turn lobed or toothed. Owing to the close general resemblance of this species to its immediate congeners some rather minute differences should be noted. The sepals each end in a hard point—in botanists' language, they are *mucronate*—the broader end of the narrow rosy petals is notched in the middle, and the narrow lower portion (*claw*) is fringed with hairs. The carpels, or divisions of the seed-vessel, are keeled but not wrinkled, and the seeds are *pitted*. Its nearest allies are :—

I. Round-leaved Crane's-bill (*G. rotundifolium*), with similar leaves to the last,

1 *Pl.* 50. **Cinquefoil.** (p. 57.) *F* 58.

Potentilla reptans. ROSACEÆ

1 *Pl.* 51. **Dove's-foot.** (p. 58.) *F* 59.

Geranium molle. GERANIACEÆ.

but with the petals *not* notched, the claw not bearded. Flowers pink. It is not so widely distributed, being restricted to the southern half of Britain. June and July.

II. Small-flowered Crane's-bill (*G. pusillum*). Leaves more deeply lobed, sepals as long as the notched petals, claw slightly hairy. Flowers, pale rose; June to September.

III. Long-stalked Crane's-bill (*G. columbinum*). Lobes of leaves distant from each other, the segments into which they are again cut being very narrow; sepals large, tapering, and ending in a hair-like point, as long as the entire rose-purple petals; claws less hairy than in the last. All the leaf- and flower-stalks long. Flowers June and July.

IV. Cut-leaved Crane's-bill (*G. dissectum*). Similar to *G. columbinum*, but all stalks much shorter. Bright red petals, notched. Flowers May to August.

V. Herb-Robert (*G. robertianum*). Plant more or less red. Leaves divided into five leaflets, these sub-divided. Calyx angular, the sepals long-awned and hairy. Petals narrow, not notched; purple streaked with red; claw smooth. May to September.

VI. Shining Crane's-bill (*G. lucidum*). Plant more or less crimson in summer. Leaves divided into five segments, each bluntly lobed at the top. The calyx is a wrinkled pyramid, each sepal awned. The rosy petals are much longer than the sepals; claw smooth. There are two lines of hairs on the upper branches. May to August.

VII. Bloody Crane's-bill (*G. sanguineum*). Plant hairy; stems 2 feet, bent at joints; leaf-segments five to seven, these again deeply cut; flowers 1½ inch diameter, crimson, singly on long stalks; July and August. Rocks and sandy shores.

VIII. Wood Crane's-bill (*G. sylvaticum*). Stem erect, velvety, branched, 3 feet; leaves large (4 to 5 inches), round, cut into seven lobes. Flowers ¾ inch, blue-purple or rosy, two on a stalk; June and July. Copses and meadows north of Staffordshire and Carnarvonshire.

IX. Meadow Crane's-bill (*G. pratense*). Stem erect, downy, 4 feet, branched; leaves 4 to 6 inches, round, cut into seven to nine lobes. Flowers many, 1¼ inch diameter, blue-purple; June to September. Moist meadows.

X. Mountain Crane's-bill (*G. pyrenaicum*). Root-stock spindle-shaped, stems at first leaning, then erect. Leaves kidney-shaped, seven- to nine-lobed, 3 inches across. Flowers, ½ inch, bright red-purple; petals two-lobed; June to August. Meadows.

Wild Geranium scattering seeds.

All the above are annual or biennial plants. The name of the genus is from the Greek *geranos*, a crane, from a fancied resemblance in the fruit to a Crane's-bill.

The mechanism for the dispersal of seeds in the Crane's-bills

is worthy of attention. When the petals fall off the carpels enlarge, and the outer layer of the style separates from the axis, splitting into five portions, each attached to a carpel at the bottom and to the style at top. The axis of the style further elongates, but the tails of the carpels do not, and there is, in consequence, great tension, which ends in the carpel being detached from its base. The "tail" curls up, the carpel is reversed, and the seed is thrown out.

Wood Avens or Herb Bennet (*Geum urbanum*).

On the borders of woods, in copses, and on shady hedge-banks the Avens is abundant. Its leaves probably attract more attention than its flowers, for these being yellow are most likely to be put down as Buttercups. Of course, there is no real resemblance, for the Avens is a Rose, but most of the rich yellow roses—the Cinquefoils, the Tormentils, the Silver-weed—are popularly classed as Buttercups.

The Wood Avens is a perennial, with a short creeping root-stock. The radical leaves are long-stalked, the blade of the leaf broken up into distinct lobed and toothed leaflets, widely separated, and differing in size and shape; the terminal leaflet very large, the lowest ones very small. The stem-leaves are composed of three long leaflets, coarsely toothed. The stipules at their base are large and leafy, lobed and toothed. The stem may be as much as 3 feet in length, bearing erect flowers solitarily on long diverging footstalks. These flowers vary from $\frac{1}{2}$ to $\frac{3}{4}$ inch in diameter. The calyx has five long, pointed lobes, with five pointed bracts alternating with them. The five petals are bright yellow, and spread themselves out flat, the calyx-lobes showing green between them. As in most roses, the stamens may not be easily numbered; the carpels, too, are numerous, and develop into a head of nutlets, each with a sharp

1 *Pl.* 52. **Wood Avens.** (p. 60.) *F* 60.

Geum urbanum. ROSACEÆ.

1 *Pl.* 53. **Common Mallow.** (p. 61.) *F* 61.

Malva sylvestris. MALVACEÆ.

curved hook at its tip, by which they catch in fur or feather, and so get scattered by bird and beast. The flowering period is chiefly between June and August. It was formerly called Herb Benedict, afterwards contracted to Herb Bennet, a name which still survives.

The only other British species is the Water Avens (*G. rivale*); a shorter and stouter plant, more hairy; with larger drooping flowers of purple calyx and orange petals. It flowers from May to July beside streams, and in damp copses.

The name is from the Greek, *geuo*, to have an agreeable taste, in allusion to the clove-like odour and flavour of the roots, which are used as a flavouring for Augsburg beer. The word Avens appears to be the same as awn, and both are probably derived from the Latin, *avena*, an oat. It has reference to the awned fruits.

Common Mallow (*Malva sylvestris*).

In some places the Common Mallow is known by the undignified name of Rags-and-Tatters. Such a name could only have been suggested by one of the unfortunate specimens that have chanced to grow between the roadside and the ditch, and which suffer from the occasional trimming-up zeal of the hedger and roadman. Many mutilated specimens are found in such situations, and when their leaves—riddled by snails and caterpillars—are liberally coated by road-dust, they do present a forlorn and ragged appearance. But when the Common Mallow is allowed to grow unmolested in a waste corner of the field, or by the copse-side, it is a thing of considerable beauty. It has a somewhat hairy erect stem, growing to a height of 3 or 4 feet. The leaves are kidney-shaped, the margin broken up into five lobes which have toothed edges. The flowers, which are produced from the axils of the leaves, are large ($1\frac{1}{2}$ inch), and of a

pale purple (mauve) tint, with darker lines converging to the centre. The five petals are heart-shaped. They are in evidence from June to September. It will be observed that in newly opened flowers the anthers are ripe and shedding their pollen, whilst the ten styles are not yet mature. When, later, the stigmatic upper surfaces of these become fit for pollination, they hold themselves strictly above the drooping stamens, so that self-fertilization is impossible. It is interesting to compare these points with the action of corresponding parts in another common species, the Round-leaved, or Dwarf Mallow (*M. rotundifolia*), which is found on roadsides and rubbish-heaps at the same season. The downy stems lie along the ground, and bear many small, roundish, lobed or toothed, leaves. The flowers, too, are small ($\frac{3}{4}$ to 1 inch), of similar tint to those of its larger relative; but as they are not sufficiently conspicuous to attract many insects in their lowly situation, they adopt different methods. Anthers and stigmas mature simultaneously, and the styles, instead of keeping aloof from the anthers, curl and twist among them, and so ensure self-pollination.

A third species is the charming Musk Mallow (*Malva moschatus*), which grows in dry meadows, hedgerows, and copse-sides. It is an erect-growing species, about 3 feet in height, well clothed with leaves, which are cut up into a number of narrow segments after the manner of the so-called Oak-leaf Geranium of our gardens. When these leaves are passed through the hands they yield a slight musky odour, from which the names of the plant are derived. The flowers are almost as large as those of the Common Mallow, but of a beautiful rosy tint, borne in clusters at the summits of the numerous stems during July and August. These are the only native members of the genus, and they all agree in the possession of an *epicalyx*, which consists of a series of bracts attached to the sepals, and producing the appearance of "doubling" in the calyx. They are all perennial plants. Their fruits consist of

1 *Pl.* 54. **Meadow-sweet.** (p. 63.) *F* 62.

Spiræa ulmaria. ROSACEÆ.

1 *Pl.* 55. **Red Clover.** (p. 64.) *F* 63.

Trifolium pratense. LEGUMINOSÆ.

a number of one-seeded carpels, arranged in a ring—the "cheeses" of our youth.

These are the only British species. The genus is named from the Greek *malaché*, soft, the mucilaginous juices of these plants being employed medicinally as an emollient.

Meadow-sweet (*Spiræa ulmaria*).

Our first encounter with the Queen of the Meadows, or Meadow-sweet, is an event to be remembered. It will probably be beside a shallow stream, and for a long distance we shall see the continuous line of thick clumps, with the handsome, much-divided radical leaves standing erect around the taller furrowed stems. Individually the creamy-white flowers are minute, but combined in large dense cymes they are very conspicuous. There is an airy grace about the plant that is particularly charming, quite apart from the attraction of its powerful fragrance.

Meadow-sweet has a short perennial rootstock, the leaves are interruptedly pinnate, the terminal leaflet three-lobed. The undersides are downy and white. The stem-leaves are provided with broad-toothed stipules. In spite of their fragrance the flowers produce no honey; but, attracted by the sweet odour, insects visit them in great numbers, and from the closeness of the flowers cannot help fertilizing them. The calyx has four or five lobes, turned back; the petals are four or five, the carpels vary from five to nine, curiously twisted, and surrounded by a large number of stamens. It flowers from June to August, and may be found beside watercourses and in wet meadows, as well as by the sides of streams and rivers.

There is one other British species:—

The Dropwort (*Spiræa filipendula*), which grows far away from the haunts of the Meadow-sweet, delighting in high dry pastures, chalk downs, and gravelly heaths. He that has seen *ulmaria* will not fail to identify *filipendula* as the sister of the

meadow queen, for though of much dwarfer habit, and with larger flowers, it is in general appearance very similar. The unopened flowers are rosy, but the inside of the petals is of the same creamy-white as in Meadow-sweet. It is not fragrant. Flowers June and July.

A third species, the Willow-leaved Spiræa (*S. salicifolia*), may occasionally be met with in plantations; but it is not a native.

The name of the genus appears to have originally come from the Latin *spira*. Pliny mentions a plant under the name of *Spireon*, and the name appears to have been transferred to this genus.

Clovers or Trefoils (*Trifolium*).

Everybody knows a Clover when he sees it; it is therefore unnecessary to take up our space with a general description. Their great value as pasture plants has caused their typical forms of flower and leaf to be well known; but we have so many native species, to say nothing of the introduced kinds, that few besides botanists and agriculturists are acquainted with their specific characters.

All the Clovers or Trefoils are Leguminous plants, and the structure of the individual flower is very similar to that of Broom (see page 42); but the flowers are much smaller, and are gathered into a conspicuous head. In certain species there are floral bracts, and in some these form an involucre. It is characteristic of most of the clovers that when the seed is set the petals do not fall off, but simply dry up and wrap round the pod. The name of the genus is Latin, and signifies *three-leaved*. The principal British species are:—

I. Subterranean Trefoil (*T. subterraneum*), so called from its singular habit of burying its pods in the earth when they are ripening. The plant has many creeping stems, covered with soft hairs. The heads of flowers are cream-coloured, and are produced in the axils. The individual flowers are long and slender; only a few in each head are fertile, and in this species the petals fall off early. The pod is a compressed orb. Dry, gravelly pastures. May and June.

II. Common Purple or Red Clover (*T. pratense*). (See Pl. 55.) This is the clover so commonly grown in meadows as an important ingredient in the hay-crop. Its large oval leaflets are frequently marked with a whitish band that takes more or less of a quarter-moon shape. Its flower-heads are round, afterwards becoming

1 *Pl.* 56. **Hop Trefoil.** (p. 65.) *F* 64.

Trifolium procumbens. LEGUMINOSÆ.

1 *Pl.* 57. **Milkwort.** (p. 66.) *G* 65.

Polygala vulgaris. POLYGALACEÆ.

longer than broad, purplish red in colour. Calyx-teeth slender, bristly, not longer than corolla. Top of pod dropping off when ripe. This is the clover Darwin made famous by showing that the cultivated forms must die out but for the humble-bees, whose tongues alone are long enough to fertilize its long flowers. Meadows, pastures, and roadsides. May to September.

III. Zigzag or Meadow Clover (*T. medium*). Leaflets more pointed than in *pratense*, and spotless. Stem branched in such a manner as to give it a peculiarly zigzag appearance. Heads larger, and of a deeper purple than *pratense*. Calyx-teeth half the length of corolla. Pod splitting lengthwise. Pastures, flourishing in lighter soils than *pratense*. June to September.

IV. Soft Knotted Trefoil (*T. striatum*). Stem more or less reclining, downy or silky. Flower-heads both terminal and axillary, small, rosy-red, broader at the base. Calyx-tube swollen, ribbed, contracted at mouth, teeth not so long as corolla. Dry pastures. June and July.

V. Rough Rigid Trefoil (*T. scabrum*). Stems rigid, prostrate. Leaflets rigid, toothed, the veins thickened. Flower-heads broadest in middle. Flowers small, the corolla white, calyx purple; calyx-teeth as long as corolla. Chalky and sandy pastures near sea. May to July.

VI. Dutch Clover (*T. repens*). Stems smooth, creeping, but not rooting. Leaflets often with a dark spot at the base, below a whitish band. Heads of flowers globose, all produced from the axils, on long stalks. The flowers white or pinkish, attached by short stalks, which are recurved after flowering, so that the pods are all drooping. Meadows and pastures. May to October.

VII. Strawberry-headed Clover (*T. fragiferum*). Similar in habit to the last. Flower-head globose, of small purple-red flowers, much larger after flowering, when the calyces swell and take on a red colour, which increases size of head to 1 inch in diameter, and gives it a strawberry-like aspect. Meadows and pastures. July and August.

VIII. Hop Trefoil (*T. procumbens*). This must not be confounded with the Hop Trefoil of the farmer (*Medicago lupulina*), in which the flowers are borne in spikes (see page 98). The stems are downy, one growing erect, others all round it creeping. The flowers are pale yellow, crowded in the heads, the upper petal (*standard*) broad, and arched over the *straight* pod, turning bright brown, which gives the head the appearance of a hop strobile. The pods are always so covered in this species, whereas in *Medicago lupulina* they are naked. Dry pastures and roadsides. June to August.

IX. Small Yellow Trefoil (*T. dubium*). Stems slight, creeping, nearly smooth. Heads smaller, on long slender stalk. Flowers yellow, the standard narrow, keeled, turning dark brown after flowering, and wrapped round the pod. Similar situations and date to last.

A few more species of this genus will be found described on pages 82, 83.

Milkwort (*Polygala vulgaris*).

Nestling closely among the grass of heaths and dry pastures, the Milkwort, though commonly and profusely distributed, is not a well-known plant. It is only a few inches in height, and scarcely noticeable when not in flower. The tough, lance-shaped leaves are scattered alternately on the stem. The broad inner two of the five sepals are coloured purple, and the corolla may be the same hue, or pink, blue, white, or lilac. The structure of the flower is very curious, and should be carefully noted by aid of the pocket-lens. The stamens cohere, and the corolla is attached to the sheath thus formed. The pistil has a protecting hood over it, obviously with reference to the visits of insects; but the flower is also self-fertile. When the fruit is set the sepals turn green. Similar conduct is observable in many plants; thus in several species of *Lathyrus* the flowers immediately after fertilization change from purple or crimson to blue or green, and the erect flowers of the Clovers turn down. This action appears to have relation to the visits of insects, and saves their time by indicating which flowers are still unfertilized. The name of the genus is derived from two Greek words, *polus* and *gala*, meaning much milk, from an ancient notion that cows eating this plant were enabled to give a greatly increased supply of milk.

There are two other British species:—

I. Proliferous Milkwort (*P. calcarea*), branches rooting, and giving rise to new plants. Inner sepals broader and longer. Dry soils in south and south-east of England.

II. Bitter Milkwort (*P. amara*), much smaller in all respects than the others; the inner sepals are narrow, and the leaves form a rosette. Very rare. Found only on the margins of rills in Teesdale, and Wye Downs, Kent.

Some botanists recognize two additional species, *P. oxyptera* and *P. serpyllacea*, but others regard these as sub-species or mere varieties of *P. vulgaris*. The differences between any of them are too slight to separate them easily, so the rambler is advised to regard them all simply as the Milkwort, and leave their discrimination to the specialist. They all flower from June to August.

1 *Pl.* 58. **Dog Rose.** (p. 67.) *G* 66.

Rosa canina. ROSACEÆ.

1 *Pl.* 59. **Samphire.** (p. 68.) *G* 67.

Crithmum maritimum. UMBELLIFERÆ.

Dog Rose (*Rosa canina*).

Probably most non-botanical ramblers feel able to distinguish at once between the Dog-rose and the Field-rose, and a few may feel learned enough to separate either or both from the Burnet-rose and the Sweet-briar—and they may do it. But the scientific botanist has difficulties, and he is not quite sure where one species leaves off and another begins. Many workers have so split up our six or seven British roses into a vast multitude of species, sub-species, and varieties that it is difficult to follow them. In this work we shall not attempt it. The Dog-rose is the largest of the British roses. It forms a bush of considerable size, with long arching branches covered with broad hooks. The leaves are broken up into five leaflets, each of which is sharply toothed. The sepals are five in number, pinnate, and turned back towards the stem when the flower is open. The petals are five, pink and notched. Stamens many. Styles free, hairy. The ovary is sunk in the calyx, which changes to the pitcher-shaped scarlet fruits—the "hips" of the schoolboy—in which are the hairy achenes. Flowers mostly solitary. Generally common in hedges and copses, flowering from June to August. The "hips" vary a good deal in shape and colour in the numerous forms to which reference has been made.

I. The Field-rose (*R. arvensis*) is very similar to *R. canina*, but the flowers are generally in clusters, the petals white. Sepals falling off. In similar places. June and July. Easily distinguished by its arching or trailing habit.

II. The Burnet- or Scotch-rose (*G. spinosissima*) is a much-branched shrub, with the leaves divided into seven or nine small leaflets. Stem crowded with nearly straight prickles, showing every stage in the transition from thorns to stiff bristles and glandular hairs. Petals white or pink. Fruit nearly globular. Heaths and open spaces, chiefly on sand and chalk, especially near the sea. May and June.

III. Sweet Briar (*R. rubiginosa*). A small bush with erect or arching branches, set with hooked prickles mixed with glandular hairs and bristles. Leaflets densely glandular and aromatic. Flowers small, pink. Fruit globose. Bushy places, chiefly in South of England. June and July.

Rosa is the old Latin name for these plants. The genus forms the type of the large natural order Rosaceæ.

Samphire (*Crithmum maritimum*).

Much nonsense has been written concerning the Samphire by writers who have probably never seen the growing plant. Taking their cue from Shakespeare's *King Lear*, in the well-known scene on the cliffs at Dover, where "halfway down hangs one that gathers samphire; dreadful trade!" they have described the plant as growing up the face of cliffs, and only accessible at great risks. The truth is, it grows more freely on the rocks at the cliffs' foot, except where it has been exterminated in such situations in order that it might be made into a pickle.

In this plant we make acquaintance with an important natural order, the Umbelliferæ, which includes such useful plants as Celery, Parsley, Carrot, Parsnip, Asafœtida, Anise, Dill, etc. The prevailing characteristics of this order are: The stems are hollow; the leaves, with few exceptions, are divided; the leaf-stalk at its base expands and forms a sheath to the stem; the flowers are borne on long stalks arranged like the ribs of an umbrella; the flowers are five-parted, the ovary below the petals and stamens, and the fruit what is known as a *cremocarp*.

The rambler who meets Samphire for the first time, unless it be in the flowering season, would probably regard it as having affinity rather with the Mistletoe than with the Wild Carrot and the Fool's Parsley. All its parts are thick and fleshy, and the leaves are so much dissected, that some little consideration is required before their true outline can be made out. The whole plant is exceedingly smooth and covered with that glaucous "bloom" that is common to many seaside plants. The perennial rootstock is wedged tightly in the crevices of the rocks, and the plant may be found growing very close to high-water mark. The flowers are borne in fleshy compound umbels, but the whitish petals are minute and not nearly so striking as the yellow-green ovaries. These petals are broader than long, with a long point in the middle, turned over towards the stigmas,

1 *Pl.* 60. **Bird's-foot Trefoil.** (p. 69.) *G* 68.

Lotus corniculatus. LEGUMINOSÆ.

1 *Pl.* 61. **Silverweed.** (p. 70.) *G* 69.

Potentilla anserina. ROSACEÆ.

which form a thick, somewhat conical, disc. The most conspicuous feature of the mature plant is the contrast between the yellowness of its umbels and the bluish green of the leaves and stems.

This is the only British species of the genus, which is said to owe its name to *krithe*, the Greek for Barley, from a supposed resemblance between their seeds. The English name affords a good illustration of the way in which such names have probably been evolved from a sensible and descriptive term into one which has no meaning. Samphire was originally *Perce pierre*, or Rock-cress in French, and as "rock" and "Peter" are synonymous, it by-and-by became *Perce St. Pierre*, or St. Peter's-cress. Then the prefix was dropped, and by English pronunciation the name became changed into *San Pierre*, thus into *Sampier*, and finally Samphire. It flowers from June to September.

Bird's-foot Trefoil (*Lotus corniculatus*).

From June to October our commons, pastures, downs, and railway banks are bright with the flowers of Bird's-foot Trefoil, or as it is termed in some districts, Lady's Slipper, a name which properly belongs to the rare orchis *Cypripedium*.

The plant has a short, woody, perennial rootstock, from which originate several trailing branches, which are themselves much branched. The leaves are not trefoils, as the name would lead us to suppose, for the apparent stipules at the base of the leaf-stalk are in this genus leaflets. The flowers, which are in spreading heads of from three to ten flowers, are of a pretty yellow, tinted with red. They are succeeded by little cylindrical pods about 1 inch in length, which, when three or four are in a cluster, present the appearance of a bird's claws. The plant is a valued ingredient in the formation of pastures and meadows.

There is a sub-species (*L. tenuis*), with thread-like stem, and very slender leaflets. The flowers are smaller and fewer than in the type. It grows in damper places, and is not so common.

The name was given to the genus because this was believed to be one of the plants to which the ancient Greeks applied the name Lotus.

There are three other species natives of Britain :—

I. Greater Bird's-foot Trefoil (*L. uliginosus*). More or less erect in habit. The calyx-teeth *spreading* in bud (in *L. corniculatus* they are *erect* in bud). Moist meadows and swampy places. July and August.

II. Hairy Bird's-foot Trefoil (*L. hispidus*). Annual, stems trailing, long and slender, covered with lax hairs. Pods twice the length of calyx. Banks near the sea from Hants to Cornwall. July and August. Rare.

III. Slender Bird's-foot Trefoil (*L. angustissimus*). Similar to *L. hispidus*, but stems shorter and more slender. Pod four times the length of calyx. Similar situations to last, but extending as far eastward as Kent. Very rare.

Silverweed (*Potentilla anserina*).

The beautiful and common Silverweed is botanically one of the Cinquefoils, although the leaf of this species has many instead of five divisions. The species that answer best to this descriptive name have already been dealt with on pages 56–58. This is the plant that grows in dense patches by the roadside, erecting its long pinnate silky leaves and showing the silvery-whiteness of the underside. Its rootstock is the centre from which many rooting runners radiate. The toothed leaflets are not opposite, as may appear at first sight, but alternate ; and there is the very peculiar arrangement of a minute leaflet being placed between each two large ones. This is the form of leaf known as *imparipinnate*, or interruptedly pinnate. The solitary flowers are large ($\frac{3}{4}$ inch) in proportion to the plant, of one uniform yellow, and borne singly on a long stalk arising from a leaf-axil. The calyx is cleft into five lobes, which alternate with five longer and divided bracteoles ; the petals are five, the

1 *Pl.* 62. **Sainfoin.** (p. 71.) *G* 70.

Onobrychis viciæfolia. LEGUMINOSÆ.

1 *Pl.* 63. **Grass of Parnassus.** (p. 72.) *G* 71.

Parnassia palustris SAXIFRAGACEÆ.

stamens and carpels many. Although it is a common roadside weed, it may also be found growing abundantly and much more luxuriantly in wet pastures. It flowers chiefly from June to August, and sparingly much later in the year. Its name *anserina* refers to the fact that geese are fond of it.

Its more immediate congeners are :—

I. Shrubby Cinquefoil (*P. fruticosa*). This is really a shrub, in which character it differs from all the other native species, and from most of the exotic species. It grows to a height of 4 feet, and sheds its bark in flakes; it branches freely. The silky leaves are pinnate, but after a different fashion from either Silverweed or Cinquefoil—a sort of compromise between the two, for they are oblong in general outline, but the leaflets are arranged almost digitately. The golden-yellow flowers are over an inch across, grouped in small cymes, and show a tendency to become unisexual; June and July. The range of the species is restricted to rocky river banks in the counties of York, Durham, Cumberland, Westmoreland, Clare, and Galway.

II. Strawberry-flowered Cinquefoil (*P. rupestris*). This species is much more rare than the last, the only recorded locality for it being the rocks of Craig Breidden, in Montgomeryshire. It has a woody rootstock from which it sends up erect annual stems, a couple of feet high. The pinnate leaves from the rootstock have five leaflets; those from the stem three only. The flowers are few, an inch across, and *white*, appearing in May and June.

Sainfoin (*Onobrychis viciæfolia*).

Returning to the Leguminous plants, we have here a handsome herb of aspect very different from that of the Clovers. It is much cultivated as a fodder plant in dry fields, but will also be found growing wild on chalk-hills and downs. It is, however, suspected of being an escape from cultivation that has taken to an independent life. The plant springs from a perennial woody rootstock, and its stout downy stems are more or less erect. The leaves are pinnate, the leaflets in about twelve pairs and a terminal one. The flowers are in spikes, the standard broad, the colour bright clear pink, veined with a deeper rosy tint. The pod is semicircular, wrinkled, and contains but one seed. It flowers from June to August. The

name is derived from two Greek words, signifying the braying of an ass, because that animal is fabled to bray after it when he sees but cannot reach it. Sain-foin is a word we have borrowed from the French, and means literally, *wholesome-hay* or fodder.

Grass of Parnassus (*Parnassia palustris*).

It is a singular thing that some of our most beautiful plants grow in the most unpleasant places. We remember a backwater of the River Thames that used to receive the waste waters from a large soap-works, and in the evening, when this waste was poured out, the stench arising from the ditch was unbearable. Yet, with its feet in this vile liquid, the Meadow-sweet grew luxuriantly, but truth compels us to add that its sweetness was thrown away ; it could not overcome the other smell. Black bogs and mossy swamps are the particular haunts of floral beauties, such as the marsh violet, the bog buckbean, the marsh gentian, the marsh marigold, the bog pimpernel, the sundew, the bog asphodel, and the butterworts ; and it is in such places we must look for the Grass of Parnassus, a plant so pretty and elegant of form that it must first have grown upon Mount Parnassus in the Golden Age. At any rate, the English name is a mere translation of that given to it by Dioscorides, among the six or seven hundred plants mentioned by him.

It is a perennial, with a stout rootstock. With few exceptions the leaves are radical ; they are heart-shaped, smooth, with untoothed edges, and on long stalks. The flowering stems are long, angular, with a stalkless leaf nearly halfway up. At the summit is the solitary large flower. The five thick sepals are slightly conjoined at their bases, the petals white, veined, and leathery. The ovary is large, and on its summit, without

the intervention of a style, are the four rayed stigmas. Around the ovary are five stamens—there should be ten, but five have been transformed into scales, which alternate with the perfect stamens, and are fringed with white hairs, each ending in a yellow knob ; on the face nearest the ovary each scale bears two small honey-secreting glands. The perfect stamens ripen in succession, and as each becomes mature, it raises itself until the anther comes on a level with the stigma, but with its back to it. The front opens and discharges the pollen away from the stigma; but it falls where insects seeking the honeyed glands (using the ovary as a perch) will get it upon their forelegs, and so attach it to the stigmas of the next flower they visit.

It flowers in August and September. This is the only British species. It introduces us to the Saxifrage family, of which we shall find other examples on pages 75 and 98.

Fennel (*Fœniculum vulgare*).

To see the Fennel in its native haunts we must seek the coast where there are cliffs, up whose face we shall find its tall, stout, jointed stems and umbels of yellow flowers.

Fennel grows to a height of 3 or 4 feet, with a round and tubular, but almost solid stem, quite solid at the joints, and grooved. The leaves are so much divided that the divisions are merely many green threads. The flowers are individually minute, the petals yellow, but to give them greater prominence they are gathered into umbels, and these are arranged in *umbels of umbels*, or what botanists would term *compound* umbels.

The ovary consists of two carpels placed face to face, in each of which is a single seed suspended like a nut in its shell (*pericarp*). Each of the carpels with its ripe seed is termed a *mericarp*, and the entire fruit is a *cremocarp*. It is hard on the

reader to fling all these technical terms at him at once, but in truth there is no help for it. If he wishes to become acquainted with the extensive order of Umbelliferous plants he must constantly use these terms, for the fruits play an important part in distinguishing umbellifers of various genera.

The mericarps in Fennel are half-round, and marked on the outside with five ridges, which indicate the lines of union of the sepals (which are adherent to the carpels) and the central keels of the sepals. Between these ridges are tubes (*vittæ*) containing essential-oil, and it is to their presence that fruits of this order owe their aromatic qualities. An enlarged figure of one of these mericarps is given on the plate beside the plant.

The genus bears the old Latin name for this plant, which is the only native species.

Grass Pea (*Lathyrus nissolia*).

Until the flowers are out it would be idle to search for the Grass Pea, for it grows in meadows among grass, and it is got up to resemble a grass plant exactly. All the Pea and Vetch family are desirable fodder plants on account of the large proportion of nitrogen they contain, in common with Clovers, etc. It is, therefore, to the advantage of the plant that browsing animals should not be able to pick it out by sight from the grasses by which it is surrounded.

The Grass Pea is an annual plant with an erect stem, growing to a height of about 2 feet, but is entirely without true leaves, leaflets, or tendrils. The leaf-stalk, however, is flattened out until it closely resembles a leaf of grass, and the stipules at its base greatly help the deception. The flowers, which are rather small, are solitary, and borne on a very long footstalk ; they are crimson in colour, and have the power of self-pollination. They appear in June, and are succeeded by long slender pods, which

1 *Pl.* 64. **Fennel.** (p. 73.) *G* 74.

Fœniculum vulgare. UMBELLIFERÆ.

1 *Pl.* 65. **Grass Pea.** (p. 74.) *G* 75.

Lathyrus nissolia. LEGUMINOSÆ.

are at first very flat, but become cylindrical when the contained peas are fully developed.

Other members of the genus *Lathyrus*, in addition to those described on pages 53, 54, are :—

I. Yellow Vetchling (*L. aphaca*). Like the Grass Pea, this is an annual, but it must be sought in the cornfield rather than the meadow, its long stems (3 feet) trailing and climbing among the corn and the weeds that usually crowd the borders of a cornfield. It has a particularly leafy appearance, but as usually met with has not a leaf. If we look for it in spring when newly sprung from seed, we may find leaves upon it, broken into a pair of oval leaflets, but the apparent leaves of older plants are greatly enlarged stipules of a spear-shape. The leaf-stalks finish off as tendrils. The flowers, which are pale yellow, and ½ inch across, are borne singly on their long footstalks, and may be looked for in June and July. They are succeeded by curved pods about 1¼ inch long. The plant does not occur north of Norfolk and Warwickshire, nor in Cornwall.

II. Tuberous Pea (*L. tuberosus*). In Essex cornfields only, where it is suspected to have been introduced by man from the Continent. It has a creeping rootstock, and from its rootlets are produced small edible tubers. Its angled stem to a length of 4 feet trails along the ground or climbs neighbouring plants. Its leaves are broken up into egg-shaped leaflets, and end in tendrils. The large stipules at their base are half-spear-shaped. The crimson flowers, about ¾ inch across, are borne in small racemes on a long stalk, and may be found from June to August.

Golden Saxifrage (*Chrysosplenium oppositifolium*).

The Golden Saxifrage is one of the less known of our common plants, though it occurs in very great abundance. You enter a copse or wet wood in spring, and between the trees on either hand you see sheets of gold upon the ground. At your feet is a bed of Marsh Marigold, and you naturally conclude that all the golden patches in the wood are produced by the same plant. As a matter of fact much of it consists of the Golden Saxifrage, and when you have had your attention drawn to this plant, and pluck a shoot to examine it, you are surprised to find that such a brilliant effect is produced by so insignificant a flower—for it is only $\frac{1}{6}$ inch in diameter, and it has no petals.

It is a lowly perennial with creeping stems, which root as they go, but keep the growing end in the air. They branch a

good deal, and are well covered with nearly round, somewhat spoon-shaped leaves, nearly an inch across, the lower ones clothed with pale scattered hairs. These leaves are arranged in pairs on the stem, hence the name *oppositifolium.* Towards the growing extremity of the stem both leaves and shoots are crowded, their rich dark green providing a good background to throw up the little cyme of golden flowers and bracts. Each flower consists of an urn-shaped calyx-tube with four broad spreading yellow lobes with green margins. When the flower opens the calyx segments curve over the eight anthers, which have not yet discharged their pollen, in order to give the already mature two styles a chance of fertilization by pollen brought by insects from older flowers. The flowers are to be found from April to June by the sides of streams and rills and on wet places in woods. They are succeeded by thin two-lobed capsules, which open when ripe by a cross-shaped slit at the top.

In Eastern France, at least, the Golden Saxifrage is used by the peasants as a salad under the name of Rock-cress, but in our own country it was formerly prescribed as a remedy for melancholy and disorders of the spleen. This belief in its virtues is probably embalmed in its Greek name *Chrysosplenium* from *chrusós*, gold, and *splen*, the spleen, meaning the golden spleenwort.

There is only one other British species:—

Alternate-leaved Golden Saxifrage (*C. alternifolium*), which has a somewhat more restricted range than its congener. It is very similar in general appearance, but is more tufted in habit, the unbranched stems growing erect to a height of about 4 inches, and the leaves, which are kidney-shaped, are arranged alternately on the stems, as its names imply. It commences flowering a little in advance of the other species, and is out of bloom correspondingly early.

Horseshoe Vetch (*Hippocrepis comosa*).

The flowers of the Horseshoe Vetch are probably often passed over as belonging to the Common Bird's-foot Trefoil (page 69),

1 *Pl.* 66. **Golden Saxifrage.** (p. 75.) *G* 76.

Chrysosplenium oppositifolium. SAXIFRAGACEÆ.

1 *Pl.* 67. **Horseshoe Vetch.** (p. 76.) *G* 77.

Hippocrepis comosa. LEGUMINOSÆ.

but the plant as a whole, or its leaves or pods, could not be so mis-identified. This is a perennial plant with a woody root-stock, from which spring many branching stems. The leaves are *pinnate*, like those of Sain-foin (page 71), though the leaflets are not so numerous. In *Hippocrepis* they vary from four to eight pairs, with an odd one at the tip. The flowers as mentioned have a general resemblance to those of *Lotus*, though much smaller, and are from six to ten in each umbel on a long curved stem. They are succeeded by pods that in no way resemble *Lotus*, being rough, serpentine in shape, as represented in our figure, and jointed. It flowers from May to August, and may be looked for on chalk hills and stony pastures, but only in England, and in Ayr and Kincardine. It appears not to occur in Ireland. In some places, as on the escarpment of the North Downs in Surrey, it will be met with in great profusion. This is the only British species.

The name is from two Greek words, *'ippos*, a horse, and *krepis*, a shoe, in allusion to the form of the pods. If broken at the joints each portion containing one seed bears *some* resemblance to a horseshoe.

Cow Parsnip or Hog-weed (*Heracleum sphondylium*).

One of the most conspicuous constituents of the moist hedge-row and waste is the coarse-growing Hog-weed, or Cow Parsnip, with its great umbels of white flowers, and its broad, dust-covered leaves. It has a thick, rough, grooved, and hairy stem, which commonly attains a height of 4 feet, but frequently reaches as high as 6 feet; it is hollow, and its upper portion is branched. This is one of the Umbelliferæ, the great natural order whose genera and species agree in having their little flowers made conspicuous by massing them in flat bunches, by an arrangement of stalks like that of the umbrella's ribs. One of the characteristics of that order is the prevalence of much-divided

leaves ; but Cow Parsnip is one of the few whose large leaves are not nearly so much cut up as is general in the order. These, it is true, are pinnate, but the leaflets, instead of being again pinnate, are simply lobed. The compound umbels form a large head of bloom, varying in tint from white to pink, the outer ring of flowers very irregular in form.

Hog-weed is very convenient for observing the characteristic fruiting of Umbellifers. The two carpels have developed into slightly convex, shield-shaped fruits, suspended from the upper part of their inner surface by attachment to the tip of a bristle, which is dignified with the sounding name of *carpophore*, or carpel-bearer. One of these fruits (natural size) is represented in the plate just below the enlarged figure of a detached flower. Within each of these fruits is a single flat seed, and the outer shell is ridged and grooved in a manner that is peculiar to each species. In Hog-weed each fruit has five ridges, one near each border, parallel with the outline, one down the centre, and one on each side of the last. Between these ridges are four slightly curved, club-shaped brown marks, due to the presence, beneath the skin, of oil-tubes (*vittæ*) containing the essential oil to which these fruits owe their aromatic qualities. On the inner face of the fruit there are two similar *vittæ*.

This is the only British species, and may be found in flower from June to September. The name of the genus is derived from Hercules, and may refer to the strength and robustness of the plant, or to some strength-giving virtues supposed to be possessed by it. The plate shows only the upper part of the plant ; the lower leaves are similar to the upper ones, but frequently are as much as 3 feet in length and proportionately broad. The dead dry hollow stems—known as "kex" or "kecks"—stand stiffly all the winter, and the rambler interested in other branches of Nature Study would do well to examine such as have a hole in them. They are winter resorts of numerous small creatures, such as beetles and snails.

1 *Pl.* 68. **Cow Parsnip or Hog-weed.** (p. 77.) *G* 78.
Heracleum sphondylium. UMBELLIFERÆ.

1 *Pl.* 69. **Crab Apple.** (p. 79.) *G* 79.

Pyrus malus. ROSACEÆ.

Crab Apple (*Pyrus malus*).

The Wild, or Crab Apple, as a rule, is a low tree of 20 or 30 feet stature, but sometimes is found as high as 40 or 50 feet. It is not a tree of special elegance, its outline being irregular, and spreading with some rough approach to a roundness of head. The branches of the Crab frequently develop thorns to indicate relationship with the Wild Plums. Its leaves are of the rounded oblong shape, an inch or two long, toothed, on long stalks. But the Crab is admitted here not as a tree but as a flower. The flowers are borne in few-flowered umbels, and the rosy undersides of the petals give the tree a beauty that no other species of the genus *Pyrus* possesses. These flowers are an inch or more across, of the usual Rose type, the five separate carpels being ultimately buried in the fleshy upgrowth of the flower-stalk, and become the "core" of the golden yellow, or fiery red, globular fruit, an inch or so in diameter, with which the rambling schoolboy fills his pockets. The flowers usually appear in May, and their stigmas mature before the anthers, so that as their abundant output of honey induces many insects to visit them, there is sufficient provision made for cross-fertilization.

There are really two varieties of the Crab, the first (*P. malus* proper) with the young leaves and the calyx-tube smooth, the footstalks smooth or nearly so, and the fruit hanging down; and the var. *mitis*, with all these parts downy and the fruit erect on the footstalks.

It is believed that the cultivated Apple was introduced to Britain by the Romans, but it is not meant to suggest by this statement that these invaders were the original pomiculturists. The Apple was known as a food to prehistoric man, as we have evidence in the exploration of the lake-dwellings.

The genus includes the Wild Pear (*P. communis*), the Wild Service (*P. torminalis*), the White Beam (*P. aria*), the Mountain

Ash (*P. aucuparia*), and the Medlar (*P. germanica*), all of which will be found treated at length, with illustrations, in the writer's companion volume, "Wayside and Woodland Trees."

Hemlock Stork's-bill (*Erodium cicutarium*).

Closely related to the Crane's-bills (see page 58)—and at one time included in the genus Geranium with them—are the Stork's-bills, of which we have three British representatives. Only one of the three, however, is at all plentiful, and that is the one we have figured. It is a common species, but must be looked for on dry wastes and commons, especially near the coast.

Quite apart from its umbels of pretty pink flowers it is a handsome plant. The leaves are cut up into a large number of leaflets, arranged in slightly irregular pairs on either side of the rib, and these leaflets are cut up into many irregular lobes. It is the arrangement so common in ferns: the leaf is *pinnate*, because it is furnished with pinnæ, or wings, and as the pinnæ are themselves almost winged they are pinnatifid, or cut in a pinnate manner. The parts of the flower agree in number with those of Geranium, that is, sepals five, petals five, stamens ten (but five are imperfect, and produce no anthers), stigmas five.

Stork's-bill seed.

The fruits agree pretty closely with those of the Crane's-bills, but in *Erodium* the tails of the carpels are lined on their inner face with fine silky hairs, and instead of curling simply they twist spirally, and cause the hairs to stand out at right angles. The seed remains attached to the tail, which becomes detached from the axis of the style and is blown to the ground. There the twisted tail is alternately lengthened and shortened by moisture and dryness

1 *Pl.* 70. **Hemlock Stork's-bill.** (p. 80.) *G* 80.
Erodium cicutarium. GERANIACEÆ.

1 *Pl.* 71. **Agrimony.** (p. 81.) *H* 81.

Agrimonia eupatoria. ROSACEÆ.

of the atmosphere, and with assistance of the hairs this automatic movement gradually forces the pointed hairy seed into the ground. It flowers from June to September.

The Musky Stork's-bill (*E. moschatum*) is much larger than the last mentioned. It is easily identified by the strong smell of musk. Flowers rose-purple, June and July. Its range extends south from Pembroke and Worcester to Dorset and Cornwall; it occurs in the Channel Islands and, locally, in Ireland.

The Sea Stork's-bill (*E. maritimum*). Leaves narrow, heart-shaped, lobed and toothed. Petals minute, pale pink, sometimes absent. Sandy and gravelly coasts: rare. May to September.

The name of the genus is from the Greek, *Erodios*, a heron, and is suggested by the shape of the fruit.

Agrimony (*Agrimonia eupatoria*).

One of the prettiest of wayside plants is the golden-starred Agrimony, growing on the waste green flanks of the road and making it beautiful. It is a perennial plant, with a short woody rootstock, and "interruptedly pinnate" leaves, somewhat resembling those of the Silver-weed, the leaflets increasing in size as they near the terminal leaflet. The flowers are borne on that kind of inflorescence called a *raceme*, in which each flower is attached to the central stem by a stalk of its own. Were these stalks suppressed the inflorescence would be termed a *spike*, and indeed some authors have so described the flower-clustering of Agrimony. The flowers are little yellow roses, and consist of a top-shaped spiny calyx, tubular, with contracted mouth and five overlapping lobes; five golden petals, ten or more stamens, and two carpels sunk in the calyx-tube, their styles and two-lobed stigmas protruding. They do not secrete honey, and are seldom visited by insects, though their fragrance has been likened to that of the Apricot.

As the lower fruits ripen the raceme lengthens, and concurrently the calyx-tubes and their spines harden and assume a drooping position, owing to the downward curving of their

little footstalks. From August onward the rambler is likely to have the lowermost portions of his clothing covered with these tenacious little burs.

There is a sub-species (*A. odorata*) with resinous-scented, larger, more crowded flowers, of local occurrence. Agrimony was formerly held in some repute as a medicinal plant, and from this circumstance it gets its name. The ancient Greeks had a word *argema* signifying the affection of the eyes to which we apply the term "cataract," and a plant which was reputed to cure argema they called *argemone*, a word which has since been corrupted into agrimony. "Yarb doctors" still give it a place in their pharmacopœia, and we have heard wonderful accounts in rural districts of its curative effects in the most diverse disorders. A yellow dye has also been obtained from its rootstock.

Agrimony flowers from June to September. It is the only native representative of a small genus.

Hare's-foot Trefoil (*Trifolium arvense*).

There is a small and distinct group of Clovers, of which the Hare's-foot may be taken as the type, with the flower-heads of cylindrical form. We have already dealt with the general characters of the genus *Trifolium*, and given brief descriptions of many of the British species (see page 64). Hare's-foot Trefoil (*Trifolium arvense*) is a downy annual with many stems, almost erect, and the rather distant leaves of three slender leaflets, $\frac{1}{2}$ to $\frac{3}{4}$ inch long. The leaf-stalk is provided with a pair of large stipules ending in long bristly points. The flowers are very small and numerous, gathered in long soft heads ($\frac{1}{2}$ to 1 inch) on lengthening stalks, pinky-white in colour. The persistent calyx-teeth are much longer than the petals, and give a bristly appearance to the flower-heads, which are in evidence from July to September in dry fields. The

1 *Pl.* 72. **Hare's-foot Trefoil.** (p. 82.) *H* 82.

Trifolium arvense. LEGUMINOSÆ.

1 *Pl.* 73. **Hare's-Ear.** (p. 84.) *H* 83.

Bupleurum rotundifolium. UMBELLIFERÆ.

plant is about a foot in height, and its general appearance is very delicate and pretty.

In addition to the species described in previous pages, we may mention as in form of head somewhat approaching *T. arvense* the two first following :—

I. Boccone's Trefoil (*T. bocconei*). A very rare annual species, confined to the Lizard district in Cornwall. A downy plant with leaflets and stipules of an oval shape, the leaflets smooth and free from hairs on their upper surface. Heads not quite so long as in *arvense*, pink and white. The calyx-teeth are not so long as the petals ; the calyx remains around the seed-pod. Flowers in July.

II. Crimson Clover (*T. incarnatum*). An introduced plant from South and West Europe, in general cultivation and naturalized. A downy annual with slender stems, leaves with short footstalks, the leaflets broadly oval or heart-shaped, 1 or 1½ inches. Heads at first oval, afterwards cylindrical, reddish purple, 1 to 2 inches. Calyx, with strongly developed ribs and hairy teeth, shorter than corolla. June and July. There is a variety (*molinerii*), with pale yellow or rosy heads, occurring at the Lizard, where it is believed to be truly wild, and probably the original form of the cultivated plant.

Other species of rare or local occurrence are :—

III. Sulphur-coloured Trefoil (*T. ochroleucon*). This perennial species must be looked for only in the Eastern Counties or the Channel Islands, in dry pastures. It has oblong leaflets, and terminal flower-heads 1 inch across, at first globose like those of the White Clover, but afterwards becoming egg-shaped ; they are pale yellow, but after fertilization turn brown. They appear from June to August.

IV. Round-headed Trefoil (*T. glomeratum*). An annual plant with prostrate slender stems, and small egg-shaped leaflets. The flower-heads mostly proceed from the axils (a few terminal) and are globose, though not closely packed as in the last species. The flowers are purple and appear in June. It is a rare plant, restricted to the triangular area of South England, which has Norfolk, Kent, and Cornwall in its angles ; it also occurs in Co. Wicklow and the Channel Islands. In these districts it may be looked for in sandy pastures.

V. Suffocated Trefoil (*T. suffocatum*) is somewhat similar to the last, but the leaflets are heart-shaped, the flower-heads smaller, more oval and less conspicuous, the flowers paler; June and July. Its range is south of a line drawn from Norfolk to Anglesey, where it is rare in gravelly and sandy pastures, mostly near the sea.

VI. Upright Trefoil (*T. strictum*). A rare annual confined to the Lizard and Jersey. Its stems are more or less upright, the leaflets lance-shaped, and the heads of rosy-purple flowers very small (⅓ inch across). It flowers in June and July.

VII. Slender Yellow Trefoil (*T. filiforme*). A rare annual with very slender creeping stems and heart-shaped leaflets. The flowers are small and yellow, half a dozen or less in a cluster, which is so loose it cannot be called a head ; June and July. Dry pastures, extending as far north as Roxburgh.

Hare's-ear, or Thorow-wax (*Bupleurum rotundifolium*).

There are four species of these remarkable plants included in the British flora, and all are rare. The present species is usually styled the *Common* Hare's-ear, but it is only common by comparison with its congeners. It is an annual plant, with round, slender, hollow stem, from 1 foot to 1½ feet in height. The leaves are large and oval, the lower portion completely encircling the stem (*perfoliate*); they are distant, alternate, and glaucous; the edges innocent of teeth or other indentation. No person who jumps to conclusions after a cursory glance, would set this down among the umbelliferous plants; the appearance of the flowers is altogether dissimilar. They are clustered in compound umbels, to which there is no involucre, but the small umbels have each from three to five very large leafy bracts that are united at their bases, and have the appearance of a corolla within which the minute yellow-green real corollas look more like anthers. Each of these tiny flowers consists of five petals with turned-in tips, and five stamens surrounding the two-styled ovary. The plant flowers in June and July, and must be sought on chalk downs and in fields on a chalky soil in the southern and eastern counties.

The other British species are :—

I. Sickle-leaved Hare's-ear (*B. falcatum*). A perennial with branched rootstock. Radical leaves with footstalks which embrace the stem; stem-leaves curved. Umbels very small, general involucre of two to five short, unequal bracts; those of the partial umbels (*bracteoles*) proportionately longer, with awned tips. Flower August; fields and hedges. Surrey and Essex only.

II. Slender Hare's-ear (*B. tenuissimum*). Annual, with solid, ribbed, and much-branched stem, as much as 1½ feet. Leaves very narrow and rigid. Umbels very small, not at extremities of branches, but in the axils along branches; bracts and bracteoles unequal and awl-shaped. Flowers July, in salt marshes and wastes. Local.

III. Narrow-leaved Hare's-ear (*B. aristatum*). Annual, with solid, short-branching stem, not more than 8 inches; the branches ribbed. Leaves sword-shaped, sharp-pointed, the lower ones sometimes with footstalks. Bracts, three to

1 *Pl.* 74. **Wild Strawberry.** (p. 85.) *H* 84.

Fragaria vesca. ROSACEÆ.

1 *Pl.* 75. **Hemlock.** (p. 86.) *H* 85.

Conium maculatum. UMBELLIFERÆ.

five, with awned points. Umbels concealed in involucre. Flowers July, on sandy and rocky banks, in Devon and East Sussex only. Very rare.

It will be useful to remember that if any native umbelliferous plant be found that has the edges of the leaf entirely uncut, it must belong to this genus, unless the leaf is round with the stem attached to the centre ; in the latter case, the plant would belong to the genus *Hydrocotyle*, of which there is only one species, the Marsh Penny-wort (*H. vulgaris*).

The name is said to be derived from the Greek *bous*, an ox, and *pleuron*, ribs, from a fancied likeness between the leaf-nerves of some species and the ribs of oxen.

Wild Strawberry (*Fragaria vesca*).

Almost wherever we may go in these islands, so long as we can find shady banks and woodland clearings, we are sure to find this charming little plant. It is more widely spread, and as a species much more plentiful than the Barren Strawberry, which, as already mentioned, is often regarded as the berry-bearing plant. The Strawberry is one of those plants that are not entirely dependent on flower or fruit for a pleasing appearance, and at any time from early spring to the end of autumn will form an effective study for the decorative artist. When, in June or July, one comes upon a shady path through the wood up the hillside, and finds its banks covered with the strawberry's trefoils, above which hang the glistening red fruit, one feels ample justification for a rest and a feast. Of course, if the patch is a small one, we may be disappointed as regards the feast ; but we have come upon clear spaces between woods on the chalk downs where there was an acre or two of strawberries, and where we could get a satisfying repast without in any way hurting the prospects of the next wayfarer.

The Wild Strawberry is a little white rose ; a perennial with a woody rootstock and clothed in silky hairs. The rootstock bears three or four of the trefoil leaves, a runner or two starting off to plant out daughters at a little distance, and an ascending stem from a leaf-axil which bears flowers or fruit in an irregular cyme. The leaflets are egg-shaped or oblong, their edges cut

into coarse teeth, the upper surface strongly marked with lines showing the plaiting of the leaflet in bud. The flowers, which appear in April and May, are about ¾ inch across, pure white, the lobes of the calyx showing between the five petals. There is an epicalyx of five bracteoles which are slightly smaller than the calyx lobes. There are ten stamens, and the pistils are numerous. After fertilization has been effected, the receptacle gradually enlarges to such a size that the achenes, formerly packed closely together, are now widely separated. The so-called berry becomes red or white as it ripens, and its tissues filled with sweet juices. It now hangs drooping from the branching scape, several inches above the leaves, to delight both eye and palate of the woodland wanderer.

In some places a similar plant, but larger in all its parts, may be found. It is the Haut-bois Strawberry (*F. elatior*), escaped from cultivation. A difference will be found in the flowers, inasmuch as those of the Wild Strawberry all contain both stamens and pistils, in many of those of the Haut-bois one set of these organs will be undeveloped ; so that some of the flowers lacking pistils will produce no fruit. The larger fruit, too, has no achenes at the base of the "berry," whilst that of *F. vesca* has achenes from one extremity to the other. The Haut-bois probably represents the earliest attempts to improve *F. vesca* by cultivation.

There is no other British species ; indeed, but three or four members of the genus are known from the whole world. The name is from the Latin *fragum*, derived from *fragrans*, in reference to the fragrant fruit.

Hemlock (*Conium maculatum*).

This is supposed to be the same plant as that which supplied the state poison of Athens, by which Socrates was put to death. Like Cow Parsnip, it is an umbelliferous plant, but it lacks the

1 *Pl.* 76. **Tufted Vetch.** (p. 87.) *H* 86.

Vicia cracca. LEGUMINOSÆ.

1 *Pl.* 77. **Earth-nut.** (p. 89.) *H* 87.

Conopodium majus. UMBELLIFERÆ.

aromatic qualities so general in umbellifers when bruised, and, instead, gives forth a fœtid mousy odour. It has a biennial or perennial tap-root, like the Carrot, and a smooth stem more or less spotted with dull purple, with many branches from the upper part. The leaves are alternate, large, wedge-shaped, compound, and very fern-like, for the leaflets are opposite, distant, and themselves deeply cut in a pinnate manner. The small white flowers are in small umbels, and about a dozen of these are gathered into one large terminal compound umbel. In distinguishing this species from its allies, it is well to note that at the base of each little umbel there are three short bracts, all turned to one side (*unilateral*). The involucre of the general flower-cluster is composed of a larger number of bracts, more equally disposed. The tips of the petals are turned over inwards. The fruits are in pairs, their inner faces flat, their outer form hemispherical, with thick, prominent, and wavy ridges. An enlarged figure of one is shown on the plate, at the side of the plant. It flowers in June and July. This is the only British species, and it will be found generally distributed, growing in all sorts of waste places, and attaining a height of from 2 to 6 feet.

As already indicated, the name *Conium* is the same as that used by the ancient Greeks for the plant, and the word is said to be derived from *konos*, a cone or top, whose whirling is suggestive of the vertigo produced in the human subject by the juices of Hemlock.

Tufted Vetch (*Vicia cracca*).

Throughout the summer, from June to August or September, the bright blue flower-clusters of the Tufted Vetch may be seen in hedges and bushy places. It has a perennial creeping rootstock, angled stems 2 to 4 feet long, pinnate leaves with

many narrow oblong leaflets. The leaves vary in size, and may be as much as 4 inches long, ending in a branched tendril. The flowers are numerous, varying from ten to thirty, all directed to one side of the raceme, which has a stalk several inches in length, though the footstalks of the individual flowers are very short. The flowers themselves are about ½ inch long, bright blue, and rather hanging by their footstalks. They are succeeded by a many-seeded, beaked pod, 1 inch or less in length.

The other native species are :—

I. Slender Tare (*V. tetrasperma*). Stem very slender, about 2 feet in height. Leaflets four to six pairs. Flowers singly or in pairs, pale blue. Pods with three or four seeds. Hedges and cornfields. May to August. There is a sub-species, *V. gracilis*, with three to four pairs of leaflets, longer flower-stalks bearing one to four flowers, and the longer pod contains from five to eight seeds.

II. Common Tare (*V. hirsuta*). Similar to foregoing species, but hairy. Flowers smaller, pods shorter, hairy, and containing two seeds only. In similar situations. These are both annuals.

III. Bush Vetch (*V. sepium*). See page 96.

IV. Bitter Vetch (*V. orobus*). Leaves in seven to ten pairs of leaflets, *without tendrils*. Stem erect, branched, hairy. The flowers purplish-white, ten to twenty, in loose one-sided racemes. Pod pointed at each end, containing four or five seeds. Rocky and mountainous woods on the western side of Britain. May to September.

V. Wood Vetch (*V. sylvatica*). Rootstock perennial, creeping. Stems, 3 to 6 feet, scrambling and trailing over bushes and undergrowth. Tendrils branched. Leaves beautifully divided into six or eight pairs of leaflets. Flowers white, streaked and veined with purple, and borne loosely in a one-sided raceme, to the number of eight to eighteen. A beautiful species, found only locally in woods at high elevation.

VI. Narrow-leaved Vetch (*V. angustifolia*). An annual with short trailing stem, and many slender leaflets ; pale purple flowers, usually in pairs. Flowering from May to July in dry hedges, etc. It is suspected that this is the natural form of the Common Vetch (*V. sativa*), so largely cultivated as a fodder plant, and which may frequently be found by roadside hedges as an escape.

VII. Yellow Vetch (*V. lutea*) is a rare annual, found growing among rocks and on pebbly soils. It grows in tufts with prostrate stems, a foot or so in length. The leaves have from five to seven pairs of narrow-oblong leaflets. The pale yellow flowers are usually solitary, occasionally in pairs ; June to August.

VIII. Spring Vetch (*V. lathyroides*) is also an annual with prostrate stem less than a foot long. It is not unlike some forms of *V. angustifolia*, but much smaller. Leaflets, two or three pairs, narrow-oblong or egg-shaped. The small lilac flowers are solitary and stalkless, appearing in May and June, by roadsides and in dry pastures.

IX. Rough-podded Vetch (*V. bithynica*). A local perennial, not extending north

of Yorks and Flintshire. It has a number of stems, 2 feet in length, which trail or climb over bushes. The long slender leaflets are few in number, but variable; and the purple flowers with paler wings are usually solitary; May and June. Pods very large.

Vicia is the old Latin name for these plants.

Earth-nut (*Conopodium majus*).

Country children know the Earth-nut well, and how to find it, but grown-up persons have mostly lost the trick. Pigs never lose this knowledge, which comes by instinct, like the art of truffle-finding; therefore this plant is as often known as Pig-nut. Other names by which it is known in different localities are Ar-nuts, Jur-nuts, Yur-nuts, Earth-chestnuts, and Kipper-nuts. It is an umbelliferous plant, but by no means a conspicuous one, as it grows amidst the herbage of woods and heaths. It has a tough, slender, flexuous stem, with few leaves, and crowned with the compound umbel of small white flowers. The leaf is divided into three parts, and each of these is cut up into a number of thread-like portions, but the general outline of the leaf as a whole is a broad wedge-shape on a slender footstalk. When first the umbels open they assume a nodding attitude, but afterwards become erect. There are no bracts, either to the partial or the compound umbels. The petals are heart-shaped with a turned-in point. The rootstock is tuberous, growing as large as a chestnut, and *brown* in tint. We have often grubbed it up and eaten it in a raw condition, but it is said to be best when boiled or roasted like a chestnut, which it much resembles. It flowers all through the summer. The name, *Conopodium*, is from the Greek words, *konos*, a cone, and *podos*, a foot, in allusion to the shape of the lobes of the flower. (By some included in *Carum*.)

This is the only British species, but in certain districts another tuberous umbellifer may be mistaken for it, the Great Earth-nut (*Carum bulbocastanum*), a rare plant, that occurs only in chalky fields in Herts, Bucks, Beds, and Cambs. This has a

black tuber, an erect, grooved stem with many branches, small bracts and bracteoles, minute calyx-teeth, petals deeply notched. Flowering in June and July.

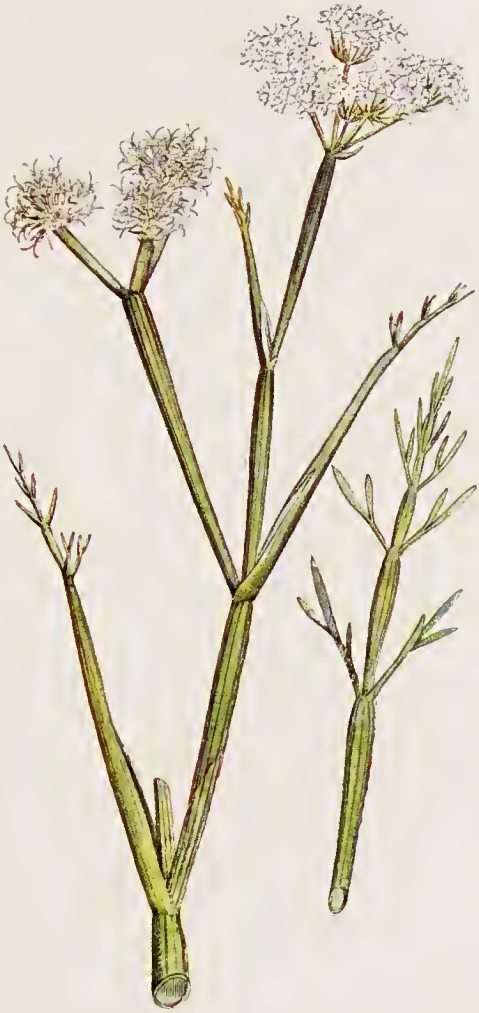
Water Dropwort (*Œnanthe fistulosa*).

A beautiful species of *Spiræa* that grows upon chalk-downs is *the* Dropwort, and the reader is warned against confusing the names. That is one of the great Rose family; this is an umbellifer like Hogweed, Hemlock, and Earth-nut. *Œnanthe fistulosa* is the most common of the six British species, though not so widely distributed as *Œ. crocata*, and may be found in most ditches, rivulets, and marshes throughout England, Ireland, and Southern Scotland. It is a perennial plant, with fleshy, fibrous roots, that burrow deeply into the mud, and are often swollen and tuberous. The rounded stems, too, and the leaf-stalks are swollen and hollow (fistular). The leaves are pinnate; those from the root with small wedge-shaped segments, those from the stem with the segments few and much narrower. Only the upper portion of the plant is shown in our plate, with one of the lower leaves. The umbel terminating the stem (which is 2 or 3 feet high) consists of three partial-umbels of tiny white flowers, all of which are fertile; but the branches bear umbels with a greater number of parts and sterile flowers. The individual fruits are about $\frac{1}{4}$ inch long, angular, with the two spiny styles still attached. The flowers may be found from July to September.

The other native species (all of which have white flowers) are:—

I. Parsley Dropwort (*Œ. lachenalii*); 1 to 3 feet, root-fibres cylindric, never tuberous; stem furrowed; leaves twice-pinnate, those from the root soon perishing, segments bluntly lobed; fruit broader than long, very small, rounded at top, with short, erect styles. Fresh and salt marshes. July to September.

II. Hemlock Dropwort (*Œ. crocata*); stem 2 to 5 feet, fistular, grooved; root-fibres spindle-shaped, 1 inch in diameter, parsnip-like; leaves broad, wedge-shaped.



1 *Pl.* 78. **Common Water Dropwort.** (p. 90.) *H* 90.
Œnanthe fistulosa. UMBELLIFERÆ.

1 *Pl.* 79. **Bramble.** (p. 91.) *H* 91.

Rubus fruticosus. ROSACEÆ.

twice or thrice-pinnate, segments wedge-shaped; umbels many, on long rays. The fruits are narrow, almost cylindric, ¼ inch, with erect, rigid styles. Marshes and ditches. July. Many fatal accidents have resulted from mistaking the roots for parsnips, or the leaves for those of celery. Juice turns yellow on exposure to air.

III. Callous-fruited Dropwort (*Œ. pimpinelloides*). Root-fibres slender, with tubers towards the extremities. Stem, 2 or 3 feet, erect, furrowed. Leaves twice-pinnate, the lower with broad short segments, the upper with long slender ones, or reduced to stalks. Umbels crowded, flat-topped. June to August. A rare plant of meadows, between Worcestershire, Essex, Sussex, and Cornwall.

IV. Sulpbur-wort Dropwort (*Œ. silaifolia*). Root-fibres spindle-shaped, leaves twice-pinnate, the pinnæ cut into slender rounded segments. Larger and stouter than the last mentioned. Partial umbels not crowded. Styles erect, rigid. Flowers June and July. Wet meadows and ditches, from Notts, Worcestershire, and Norfolk to Dorset and Kent.

V. Fine-leaved Dropwort (*Œ. phellandrium*). Root spindle-shaped, with slender fibres. Stem stout, erect, as much as 4 feet long. Leaves twice or thrice-pinnate, finely cut with pinnatifid segments; lower sometimes submerged when the segments are hair-like. Flowers all containing both sexes, though the outer ones are slightly irregular. Flowers July to September; ponds and ditches; rare in Scotland. There is a sub-species (*Œ. fluviatilis*) with half-erect, often floating stem, the leaves only twice-pinnate; segments of submerged leaves wedge-shaped. It occurs only in the southern half of England, and in Kildare, Ireland.

The name is from two Greek words, *oinos*, wine, and *anthos*, a flower, in allusion to the vinous odour from the umbels.

Bramble (*Rubus fruticosus*).

Individual examples of the Bramble vary so much from each other in small points, that botanists are far from being agreed whether these departures from the typical form shall be regarded as varieties or as distinct species. Professor Babington puts the number of British species of Bramble at forty-six; Mr. J. G. Baker (in Sir J. D. Hooker's "Student's Flora") reduces these to four species, of which one is the Blackberry (*R. fruticosus*), with twenty-two sub-species and several varieties of almost every one of these. *The London Catalogue of Plants* gives ninety-nine species, with sixty-three intermediate varieties, so that the unprofessional botanist who favours the "splitters" must be prepared to devote a large portion of his life to this one genus, and thereby, we fear, lose much of the pleasure that

the ordinary study of plants will give him. Should any of our readers desire to become Bramble-specialists we do not think they will find a better guide than Mr. Baker's arrangement; but we suspect that most will prefer to regard each of these variations as being equally *Rubus fruticosus.*

The Bramble is a member of the Rose family, and its flowers have the general characteristics of the order. The calyx forms a broad tube with five persistent lobes; the petals five in number, white or pink; stamens many. The numerous carpels are grouped upon a conical receptacle, each containing two ovules, of which only one develops into a seed. The fruit is a black or purple drupe like the Cherry, but very minute and stalkless, a large number being clustered together on the receptacle to form the succulent, so-called Blackberry. It flowers from June to September, and abounds everywhere. The stems are thick and fleshy, liberally studded with hooks, prickles, bristles, or gland-tipped hairs. They have a habit of growing half-erect, to a great length, then arching over till the tip touches the earth, when roots are emitted and a new plant arises. Sometimes a thick stem will run straight up a tree trunk and root in the moss and leaf mould that have gathered at the forking of the branches 10 feet above. The leaves are compound, usually with three or five, more or less oval, leaflets, arranged pinnately, toothed, dark-green above, paler beneath.

The other species are:—

I. Wild Raspberry (*R. idæus*). Stems round, 3 to 5 feet, whitish, with straight, slender prickles; leaves white beneath. Calyx lobes with long tips; petals short and narrow, white; flowers drooping. The drupes are many in a cluster, red or yellow, and hoary. Flowering from June to August. Woods and heaths.

II. Cloudberry (*R. chamæmorus*). Stem erect, rough, but devoid of hooks or prickles, 4 to 8 inches. Leaves few, *undivided*, broadly heart-shaped, margin lobed. Flowers solitary; pistillate and staminate flowers on separate plants (*diœcious*); white, 1 inch across. Sepals and petals oblong. Fruit orange-yellow, consisting of a few large drupes. Flowers June and July. On high moors northward of Derby and Wales.

III. Stone Bramble (*R. saxatilis*). With creeping rootstock and runners; stems of two kinds—one lying prostrate, 2 or 3 feet long, produces leaves and bristles only;

1 *Pl.* 80. **Burnet Saxifrage.** (p. 93.) *H* 92.

Pimpinella saxifraga. UMBELLIFERÆ.

1 *Pl.* 81. **Salad Burnet.** (p. 94.) *H* 93.

Poterium sanguisorba ROSACEÆ.

the other erect, from 6 to 18 inches, produces a few small white flowers, with very small petals. Leaves few, trifoliolate, downy, doubly toothed. Fruit consisting of two or three crimson drupes. Flowers June and July. Stony places in copses and by streams in mountainous districts of the west and north only.

Burnet Saxifrage (*Pimpinella saxifraga*).

This is another of those troublesome umbellifers which the beginner in botany finds so difficult to determine, on account of the strong family likeness running from genus to genus. He has not even got differences of colour to help him in the discrimination of the species, for, with very few exceptions, white is the ruling colour throughout the order. The best characters are to be found in the fruits with their ridges and *vittæ*, as we have more fully explained at page 78. Unlike so many umbellifers that prefer a moist situation, the Burnet Saxifrage is a perennial plant of the dry upland pasture. It has a slender round stem, furrowed, and branching, 1 to 3 feet high. The radical leaves are pinnate, with from four to eight pairs of variable, almost round leaflets, which may be merely saw-toothed, cut into lobes, or deeply in a pinnate fashion. They present a likeness to those of the Salad Burnet sufficiently close to have suggested part of the name. The few stem-leaves have the leaflets again pinnate, so that the whole leaf is *bipinnate*, with very narrow divisions of the leaflets. The flat-topped umbels appear in June, and consist of small white flowers, with petals deeply notched and a long point turned inwards. It continues to flower into October. The fruit is broadly oval, smooth, with the two short stigmas curved outwards. An enlarged figure of it is given, in addition to the umbel in fruit as well as in flower. A transverse section through the fruit shows each carpel to be five-sided, with slender ridges, and many *vittæ* in the furrows between. The hot and acrid root was formerly employed as a cure for toothache.

There is another species, the Greater Burnet Saxifrage (*P. major*), which is very similar to the first-named, but much larger. The stem, which is from 3 to 4 feet high, is not round but angular. The leaves are all pinnate; the leaflets of the radical leaves broad, oval, somewhat heart-shaped; those of the stem-leaves narrower than those of the radical, but larger than the corresponding parts in *P. saxifraga*. The inner flowers are male only. It flowers in July and August.

According to Linnæus, *Pimpinella* is a corruption of *bipennula*, a name suggested by the bipinnate divisions of the leaf.

Salad Burnet (*Poterium sanguisorba*).

When "cool tankards" were more generally compounded than they are to-day, Salad Burnet was a better-known plant, for, like Borage, it formed one of the ingredients. It was used also in the salad bowl, its leaves having a flavour very similar to that of cucumber. It is a perennial, the rosette of radical leaves springing from a stout rootstock. The leaves are all pinnate; the coarsely toothed leaflets in pairs, with a terminal leaflet. The stems are slender, branched, and the flowers are gathered into a purplish head. They have no petals, and are of two kinds: the upper ones have a four-lobed calyx with a narrow mouth, from which two styles with brush-like stigmas are exserted; the lower bear both stamens and stigmas, or stamens only. The stamens vary in number from twenty to thirty, attached to the mouth of the calyx, and the anthers hang out. The plant may be found abundantly in dry pastures, especially in a chalk district, flowering from June till August.

I. Rough Burnet (*P. muricatum*), found in cultivated fields in the Midlands and South of England, is probably only a variety of *sanguisorba*, owing its large size and roughness to the richer soil it finds in the fields.

II. Great Burnet (*P. officinale*) was formerly regarded as constituting a separate genus, *Sanguisorba*, but it is very similar to the Salad Burnet. Its flowers, however, are all alike, and contain both stamens and pistils. It is much larger than Salad Burnet, and its flower-heads more cylindric, longer, and of a darker purple hue. The stamens, too, are reduced to four, and instead of hanging far outside the calyx, are no longer than the lobes of that organ. The flowers produce honey,

1 *Pl.* 82. **Wild Celery.** (p. 95.) *H* 94.

Apium graveolens. UMBELLIFERÆ.

1 *Pl.* 83. **Bush Vetch.** (p. 96.) *H* 95.

Vicia sepium. LEGUMINOSÆ.

and are fertilized by insects. The leaflets are fewer and longer in this species. Its habitat is damp meadows, and its flowering time the same as that of Salad Burnet.

The name *Poterium* is the Latin term for a drinking-cup, in allusion to its use indicated above.

Wild Celery (*Apium graveolens*).

This is really the plant from which the sweet, crisp stalks of our table celery have been evolved by the gardeners, though in its wild state it is acrid, coarse, and probably poisonous. The earthing-up process, whilst, by the exclusion of light, it prevents the development of the green-colouring matter, also suppresses the strong-odoured principle that is thought to be poisonous. It grows in ditches and marshy places not far from the sea, with a perennial tap-root and a stout furrowed stem about 2 feet in height. The large smooth leaves are either pinnate, or divided into three wedge-shaped leaflets, which are cut and lobed, and the lower ones stalked. The umbels are compound, the flowers greenish-white, the petal tips greatly curved inwards. There are no bracts. Flowers June to August. The fruit is roundish, laterally compressed; carpels five-angled, with a solitary vitta alternating with the primary ridges.

There are two other British species, formerly reckoned as *Helosciadum;* they are :—

I. Procumbent Marshwort (*A. nodiflorum*), 1 to 3 feet long, *not* high; stem slender, creeping, or procumbent; leaves pinnate or trifoliate, leaflets slightly lobed and saw-toothed, variable. Flowering branches rooting at the base. Flowers small, white; petals nearly straight; umbels opposite to leaves, flower-stalks short, bracts two, one, or none. Marshy places; July and August. Perennial.

II. Least Marshwort (*A. inundatum*), 4 to 10 inches long, stem stout, wavy, decumbent, or floating. Submerged leaves twice or thrice-pinnate, leaflets hairlike, floating leaves pinnate, leaflets wedge-shaped, the lower cut into three; umbels opposite leaves, very small, short stalked, bracteoles four to six. Flowers white, very small, petals incurved. June and July; in wet places and pools that are dry in summer.

Bush Vetch (*Vicia sepium*).

We have already dealt with most of the British species of *Vicia* (see page 87), but there is still a very plentiful one to be described and figured. The Bush Vetch is very similar in general appearance to its relatives already described, so that little need be said beyond the distinctive features. It is a frequent plant in hedges and bushy places, and where it occurs it will, as a rule, be found in profusion, scrambling over the bushes. It has a creeping perennial rootstock, which gives off numerous runners, so that an old plant forms great masses. The leaves consist of six to eight pairs of oval leaflets, which vary in different individuals, in some having a squarish end with a central point, in others tapering shortly. The stipules are half-arrow-shaped. The pale purple flowers are produced, from April to September, in clusters of four to six from the axils of the leaves, and are succeeded by smooth blackish pods, an inch long, with a beak, and containing about eight seeds.

Sanicle (*Sanicula europæa*).

Along the borders of woods, in old tree-shaded lanes, and in thickets we may commonly find patches of a glossy-leaved plant with little heads of minute white flowers. It is another of those plants which once had high reputation as healers, but which none but the botanist troubles about to-day. This was especially a plant "to make whole and sound all inward hurts and outward wounds," and so it was called the Sanicle, from the Latin, *sano*, to heal or cure.

Most of the leaves spring direct from the stout creeping rootstock. They are cut into wedge-shaped fingers (*palmate*), the five lobes being each partially cloven into three, which have toothed edges. The smooth, unbranched stem is about a couple

1 *Pl.* 84. **Sanicle.** (p. 96.) *H* 96.

Sanicula europæa. UMBELLIFERÆ.

1 *Pl.* 85. **Lucerne.** (p. 97.) *I* 97.

Medicago sativa. LEGUMINOSÆ.

of feet in height, almost leafless. The umbels of flowers are so small, so irregular in form, that they do not look like umbelliferous flowers at first sight ; yet they are not only umbellate, but compound umbels. The flowers are pinkish white, the outer row in each head bearing stamens only. They are succeeded by flattened oval fruits, densely clothed with hooked prickles, which ensure the wide dissemination of the plant by clinging to the coats of the smaller animals. It flowers from May to July ; and may be found in the haunts mentioned throughout the country.

This is the only British species.

Lucerne (*Medicago sativa*).

Though the rambler will find this handsome plant growing apparently wild in the hedgerow and on the borders of fields, he must not too hastily conclude it is a native. The species has been largely grown here as a green fodder plant, for which it is highly esteemed, and it has escaped from the fields and reproduced itself without man's aid. A glance at its flowers will show it is a leguminous plant. Its stems are hollow, branched ; its leaves trifoliate, with long-pointed and toothed stipules at the base of the leaf-stalk. From the axils of the leaves arise long stalks, whose free ends are crowded with the deep purple (sometimes yellow) flowers. A peculiarity of this genus consists in the seed-pod being more or less spirally twisted. In the present species it is downy and has two or three coils. It flowers from May to July.

It has been thought to be a cultivated variety of the next species, *M. falcata*. The name *Medicago* is from the old Greek *medike*, so called because it was introduced into Greece by the Medes. The following species also occur in this country :—

I. Yellow Sickle Medick (*M. falcata*), with yellow (sometimes violet) flowers, and a flat downy pod coiled in the shape of a sickle or a ring. Dry gravelly banks,

old walls and sandy wastes in the Eastern Counties. June and July. This and *M. sativa* are perennials ; the following are annuals :—

II. Black Medick or Nonsuch (*M. lupulina*). So much like *Trifolium procumbens*, described on page 64, that farmers have given it the name of Hop-Trefoil, which properly belongs to the latter species, from which this may be easily separated by noting that the black kidney-shaped pods are naked, that is, not wrapped in the dried flower. It should also be observed that the pods are marked by prominent veins running throughout their length. Flowers small, crowded, yellow. Waste grounds and cultivated fields. May to August.

III. Reticulated Medick (*M. denticulata*). Stems creeping. Leaflets heart-shaped, toothed. Flowers yellow, in umbels. Pod beautifully covered with network of veins ; broad, flat, and coiled into a spiral ; edges with double row of spines. South and Eastern Counties, and Ireland. May to August.

IV. Spotted Medick (*M. arabica*). Similar to last, but pod more globose, network faint, the spines long and curved. Leaflets often with black spot in centre. Leaf-stalk hairy. Gravelly pastures and hedgebanks in England and South Ireland. May to August.

V. Little Bur-medick (*M. minima*) is a rare annual of sandy fields confined to the Eastern Counties from Norfolk to Kent, and also found in the Channel Islands. It has numerous, stiff, and prostrate downy stems, less than 1 foot in length ; small leaflets ($\frac{1}{3}$ inch long), egg-shaped, of varying breadth. The tiny yellow flowers (May to August) are succeeded by pods that are twisted into a ball and invested closely with hooked spines.

Three-fingered Saxifrage (*Saxifraga tridactylites*).

An interesting treatise might be written on the Flora of a Wall-top ; in such a work the Three-fingered or Rue-leaved Saxifrage would receive prominent notice, for it is one of the prettiest of mural plants. It is not more than 3 or 4 inches high, with an erect stem covered with sticky hairs. The leaves are chiefly from the root, forming a little rosette ; their general outline is wedge-shaped, but they are cut up into three (sometimes four or five) finger-like lobes. The leaves on the upper part of the stem are less divided. The flowers are only about $\frac{1}{6}$ inch in diameter, the five petals little longer than the five lobes of the calyx-tube ; but from the purity of their whiteness, and their erect bearing, they are fairly conspicuous. Stamens ten ; styles two. Flowers April to June. Annual.

There are a dozen British species of *Saxifraga*, but few of

1 *Pl.* 86. **Three-fingered Saxifrage.** (p. 98.) *I* 98.
Saxifraga tridactylites. SAXIFRAGACEÆ.

1 *Pl.* 87. **Fool's Parsley.** (p. 99.) *I* 99.

Æthusa cynapium. UMBELLIFERÆ.

these are liable to be mistaken for *tridactylites*. The nearest approaching it are :—

I. Alpine Brook Saxifrage (*S. rivularis*). A perennial, which starts with an upright stem, but this soon begins to trail, and roots as it goes. Its tufted stems are but sligbtly hairy, the kidney-shaped smooth leaves divided into five lobes. Flowers white, two or three only, July and August. Moist alpine rocks in Scotland, only at an altitude of from 3000 to 3600 feet. Rare.

II. Meadow Saxifrage (*S. granulata*). Perennial. Stem hairy and sticky, producing little brown bulbils, the size of a pea, at its base. Leaves smooth, kidney-shaped, cut into lobes ; mostly radical. Flowers, 1 inch across, white, more or less drooping. Growing in patches, in sandy fields and hedgebanks. Flowers April and May. Rare in Ireland.

III. Drooping Bulbous Saxifrage (*S. cernua*). A rare alpine plant confined to Ben Lawers at an altitude of 4000 feet. Produces scaly buds at upper part of root-stock, and in tbe axils of the upper leaves. The drooping flowers are due in July, but these are rarely seen in Scotland.

IV. Mossy Saxifrage (*S. hypnoides*). A pretty tufted plant of hilly districts north of North Somerset and Glamorganshire, where it forms moss-like cushions. It is an exceedingly variable species, that must have given great joy to the splitter, for be has got a large number of species out of it. Many of the shoots composing the tuft are barren, producing leaves only. These are cleft into three or five lobes, of which the side ones are ofteu further cleft. The flowering shoots are 5 or 6 inches long, leafy or naked, supporting a varying number of white, bell-shaped flowers, as much as 1 inch across, but often much smaller ; May to July. This species is often grown on garden rock-work.

Name, Latin, *Saxifragus*, breaking stones, from the rock-loving habit of certain species.

Fool's Parsley (*Æthusa cynapium*).

Fool's Parsley is fond of cultivated ground, and it is no unusual thing for it to make its appearance in the very garden beds that have been set apart for rearing that pot-herb for which fools are said to mistake it. It is an annual, with a spindle-shaped, fleshy root ; a round, hollow stem, which is branched, and marked with fine longitudinal lines. The leaves are smooth, compound, and bluish-green in tint. The wedge-shaped leaflets are themselves pinnate, and the pinnæ are lobed. The flowers are small and irregular, white, grouped in small umbels, which are again gathered into large umbels of umbels.

The reader is invited to turn back to page 77, where the

structure of umbelliferous flowers and fruits is more intimately described. The *small* umbels in *Æthusa* are provided with an involucre consisting of three or five bracteoles, very slender and hanging vertically; but the compound umbel has no bract. This feature will serve to distinguish *Æthusa* from all other umbellifers. The entire plant is evil-smelling, and said to be poisonous. It flowers during July and August, and is the only species. It gets its generic name from the Greek *aitho*, to burn, from its acrid character, and its specific name is a combination of *Kynos*, dog, and *apion*, parsley, which is a further note of its worthless character.

Water Milfoil (*Myriophyllum spicatum*).

There is a small natural order of inconspicuously flowered plants, called Haloragaceæ, containing three genera: *Hippuris* (Mare's-tail), *Callitriche* (Water Starwort), and *Myriophyllum*, all aquatics. They must be sought in ponds, lakes, ditches, and sluggish streams.

The most striking character of Water Milfoil (*M. spicatum*) is the feather-like leaves. These are very finely divided after the manner of a comb's teeth (*pectinate*), and are mostly arranged in whorls of four. The flowers are minute, arranged in whorls round a leafless stem, with *smaller* comb-like bracts in whorls of four beneath them. The sexes are mostly in separate flowers, but on the same spike, the upper ones staminate, the lower pistillate, and the intermediate whorls often containing both stamens and pistils. The male flowers consist of a four-lobed calyx, two or four concave petals, and two, four, or eight stamens. Female flowers with minute calyx and corolla, or none; a four- or two-celled ovary with four feathery styles; fruit a deeply lobed drupe. Flowers green. June to August.

There are two other British species:—

1 *Pl.* 88. **Water Milfoil.** (p. 100.) *I* 100.

Myriophyllum spicatum. HALORAGACEÆ.

1 *Pl.* 89. **Moschatel.** (p. 101.) *I* 101.

Adoxa moschatellina. CAPRIFOLIACEÆ.

I. Whorled Water Milfoil (*M. verticillatum*). Flowers white, bracts *longer* than flowers, pectinate or pinnatifid, in whorls of five. July and August.

II. Alternate-flowered Water Milfoil (*M. alterniflorum*). Similar to *spicatum*, but the bracts of the female flowers in whorls of three or four, pectinated, and longer than the flowers; male opposite or alternate, with entire or toothed edges, and shorter than the flowers. More slender than *spicatum*, with fewer flowers. June to August.

The genus is named from the Greek *murios*, many, and *phullon*, leaves, from the numerous divisions of the leaves.

Mare's-tail (*Hippuris vulgaris*) has narrow undivided leaves, set in a whorl of six or eight round the joints of the rounded stem. The small, solitary, stalkless flowers are set in the axils of the leaves; they are green with red anthers, and may be found in June and July. The plant grows in the shallow parts of ponds and lakes throughout Britain, but occurs only locally. Its name is from the Greek *ippos*, a horse, and *oura*, a tail.

Moschatel (*Adoxa moschatellina*).

The Moschatel is a somewhat local plant, but very abundant wherever it occurs; and it is widely distributed over the country. But it is by no means a well-known plant, even where it is most plentiful. The truth is, it gets passed over among chickweed and other low weeds of the hedge-bottom and the damp copse-side. It is but 4 or 5 inches in height, and its yellow-green flowers do not make up in prominence for its low stature, in spite of their musky odour, to which its popular and specific names are due.

The Moschatel has a tuberous root, from which run half-buried creeping rootstocks with erect, square, fragile stems, each bearing a pair of leaves. Each stem-leaf is cut into three leaflets; but there are also leaves that spring direct from the rootstock, and these may be cut into either one or two sets of three leaflets. The leaflets themselves are usually three-lobed. At the summit of the stem there is a flower of which the parts are in fours, whilst immediately below it are four others of which the parts are usually in fives. This is the normal order of things in this species, but it is not invariably followed. Our plate was drawn from one of a colony, all of whose flowers were four-parted. The calyx forms a broad open cup with rounded bottom, the

free margin with two or three lobes. The corolla is of the order called *rotate* (of which a more familiar example will be found in the Periwinkle) in which the lobes are not symmetrical, but appear to be rotating one after the other. The stamens are in pairs, each pair placed between the lobes of the corolla; and the attachment of the anthers to the corolla tube is what is known as *peltate*—that is, from the back like a button is attached. The short style separates into three or five stigmas, and the ovary develops into a succulent green berry. This is the only species in the genus. It flowers from March to May. The name is from two Greek words, *a*, privative, and *doxa*, opinion, and signifies that the plant is of no account.

Round-leaved Sundew (*Drosera rotundifolia*).

The Sundews, of which we have three native species, must be sought out, for they seldom obtrude themselves on the attention of those whose eyes have not been trained to see them. They must be looked for in peat bogs, and in moist hollows on sandy heaths, where they grow in crowds. But when once they have been found or pointed out in their habitat, one may be surprised that he has never noticed them before; for their crimson tints, and the sparkling of their globules of gum, give brilliance to their patch of bog if closely examined. The leaves of *D. rotundifolia* arise from a slender rootstock, and lie on the ground in the form of a rosette, from the centre of which the tall slender flower-stalks appear in July and August. Each leaf bears near the upper margins several rows of long crimson glands, terminating in rounded heads, and reminding one of a sea-anemone's tentacles; indeed, they serve a similar purpose. These glands secrete a clear sticky fluid, which serves to detain small insects that crawl over the leaf. Their efforts to free themselves irritate the glands, which all bend over to the insect; at the same time the margins of the leaf-blade begin to

1 *Pl.* 90. **Round-leaved Sundew.** (p. 102.) *I* 102.

Drosera rotundifolia. DROSERACEÆ.

1 *Pl.* 91. **Goose-grass.** (p. 103.) *I* 103.

Galium aparine. RUBIACEÆ.

become incurved, and the insect is effectually secured in the hollow, the soft parts ultimately being digested and assimilated by the plant. Readers desiring to learn more of these curious habits of the plant are advised to grow it in a saucer of peat and Sphagnum-moss, and to read Mr. Darwin's celebrated work on "Insectivorous Plants."

The leaf in this species, as its name signifies, has a round blade, and this is attached to a long hairy leaf-stalk. In the Narrow-leaved Sundew (*D. longifolia*) the blade is spoon-shaped, and merges insensibly into the smooth leaf-stalk. In the third British species, or Long-leaved Sundew (*D. anglica*) the entire leaf is similar to that of *longifolia*, but twice the length. In neither of the long-leaved species are the leaves laid flat as in *rotundifolia*; those of *longifolia* are borne erect, whilst those of *anglica* are half-erect. *D. anglica* is rare in the South of England; the others are well distributed. The name is derived from the Greek, *Droseros*, dewy, in allusion to the bedewed appearance of the leaves. It is the famous Ros-solis of the old herbalists, and was sometimes known as Youthwort, from a belief in its rejuvenating powers when administered medicinally.

Goose-grass or Cleavers (*Galium aparine*).

Goose-grass, although its flowers are small and by no means conspicuous, is yet so familiar by every wayside that we must not omit it from our list. It is an annual plant of the hedge, where it forms dense masses, often like curtains, the whole plant —stem, leaves, and fruits—being covered with flinty hooks. The rambling botanist, when playfully inclined, detaches a yard-length from the hedge, and deftly throwing it against his unconscious companion's back, causes a hundred hooks to catch in the warp or weft of his coat. It belongs to the Bed-straws, a genus comprising nearly a dozen British species, and

distinguished by having minute yellow, white, or greenish flowers, in which the calyx is a mere ring, and the honeyed corolla four- or five-lobed. There are four stamens, and two styles, united at their bases. The leaves are borne in whorls of from four to ten, at distant intervals on the square stem. In *G. aparine* the leaves vary from six to eight, the flower-cymes arise from their axils, the flowers are white, the fruit first green then becoming purplish. These fruits are really double, consisting of two globose lobes pressed together and bristling with hooked spines that cling to the fur or feathers of any creatures that have business in the hedgerows. And by this method of clinging it has got itself distributed throughout the length and breadth of these islands, as well as over a considerable portion of the earth's surface. Flowers June and July.

There are two other annual species on the British list :—

I. Rough-fruited Corn Bedstraw (*G. tricorne*), which is very like *G. aparine* in nearly all respects; but its leaves run away to narrower points, and when the fruit is formed, what were the flower-stalks become curved downward as though with the weight of the fruit. It flowers from June to October, and may be looked for in cornfields on a chalky soil, but only as far north as Cumberland.

II. Wall Bedstraw (*G. anglicum*) is a much smaller species, with stems only 1 foot long, lance-shaped leaves which have prickly edges and end in a bristle-like point. The small greenish-white flowers are few in number, appear in June and July, and are succeeded by small rough fruits. It is restricted in this country to an area whose northern boundary is Norfolk and Cambs, and its limits Kent and Sussex. It affects sandy places and walls.

All our other Bedstraws are perennials, and with two exceptions all have white flowers and quite small fruit. The white-flowered perennials are :—

III. Water Bedstraw (*G. palustre*), with creeping rootstock and weak, branched, rough, trailing stems, as much as 3 feet long. The leaves are oblong lance-shaped, polished, with prickles on the margins; four to six in each whorl. Flowers small, July and August. Fruit smooth. Marshes and ditches throughout British Islands, south of Sutherland.

IV. Marsh Bedstraw (*G. uliginosum*). In general appearance much like the last-named, but the leaves (six to eight in whorl) narrower, stiffer, with a bristle point. The angles of the stem are better furnished with bristles, the flowers larger and fewer. Fruit smaller, rough. In similar situations, but extending north to Caithness, and rare in Ireland.

V. Heath Bedstraw (*G. saxatile*) has a tuft of short smooth stems (6 inches) produced from its rootstock, and these lie along the ground, giving off almost erect flowering shoots. The leaves are six in a whorl, and end each in an awn. Flowers larger, and rendered more conspicuous by being less scattered. Heaths and hilly places; July and August.

VI. Mountain Bedstraw (*G. sylvestre*) is much like the last-named, but is less tufted in its habit, the smooth stems more erect, and the general character stiffer. The leaves are in whorls of six to eight, smooth, with fringed edges and an awned point. It flowers in July and August, and occurs locally on dry rocky ground, ascending to 2400 feet in Yorkshire. It does not occur in the East of England, in Wales, or West Scotland.

VII. Hedge Bedstraw (*G. mollugo*). See page 107.

VIII. Cross-leaved Bedstraw (*G. boreale*) is a smooth or downy plant, of tufted habit, with stiff, erect, branching stems, 2 feet high. The lance-shaped leaves are in whorls of four, each with three nerves. The cymes are in compact panicles, flowering from June to August. The fruit is very small, covered with hooked bristles. Like the Mountain Bedstraw, it is fond of rocky places, but likes them moist and at a good elevation. It ascends to 2800 feet in the Highlands of Scotland, and need not be sought south of Yorks and Brecon.

The species with *yellow* flowers (both perennials) are:—

IX. Lady's Bedstraw (*G. verum*), more correctly Our Lady's Bedstraw, a legend asserting that this plant formed the improvised bed of the Mother of Jesus. The rootstock forms runners, and the more or less erect stems are smooth or downy, and square. The very slender leaves have their margins turned down, and their tips ending in a hard point; they are in whorls of from eight to twelve. The numerous flowers are in dense cymes, which make the large colonies of the plant a conspicuous feature of the dry banks and downs from June to September. One of its local names is Cheese-rennet, from a former use of the flowers to curdle milk for making Cheshire cheese. It has also been used as a dye, and it is said that when animals feed upon it, it reddens their bones. (Plate 92.)

X. Crosswort (*G. cruciata*). This is very distinct from all the other species, by reason of its large, egg-shaped, pointed, and hairy leaves, and their cross-wise arrangement, four in a whorl. The flowers are larger than those of Lady's Bedstraw, in few-flowered cymes, the outer ones containing stamens only; April to June. The fruits are smooth and rather large. This is a plant of the hedgerow and copse, found throughout the country, but rare in Ireland.

The name of the genus is from the Greek *gala*, milk, and has reference to the use of some species for curdling milk as already mentioned.

Purple Loosestrife (*Lythrum salicaria*).

Often when traversing a bit of marshy country, or tracking the course of a stream or river, we are delighted to see the

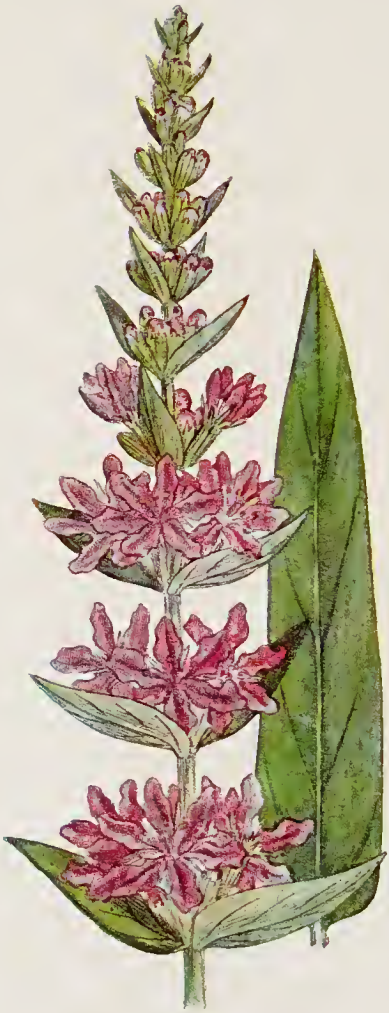
banks of the water-ways lined for a considerable distance by tall-growing herbs, with numerous starry flowers of bright reddish-purple hue. This is the Purple Loosestrife (*Lythrum salicaria*), a representative of the natural order Lythrarieæ; a perennial with creeping rootstock, and a stem that has in some individuals four angles, in others six, and in some cases as many wings. This stem attains a height of from 3 to 5 feet, is branched, and bears opposite, or whorled, entire, lance-shaped leaves and spiked racemes of flowers. The flowers are as much as an inch in diameter, and consist of a cylindrical calyx-tube with twelve teeth, of which the alternate ones are awl-shaped and longer than the others; four to six oblong petals, a two-celled ovary, and twelve stamens. It flowers from July to September.

The two forms of flower—"pin-eyed" and "thrum-eyed"—in the Primrose and Cowslip have long been familiar, even to the children who gather them; but since the publication of Darwin's and Müller's works on the part taken by insects in the cross-fertilization of flowers, the phenomenon has an interest for all botanists. The distinctive term *dimorphism* has been applied to all those cases in which a species produces two forms of flowers on different individuals. The Primrose is *dimorphic*, because the "pin-eyed" flowers have long styles and the "thrum-eyed" short styles. In *Lythrum salicaria* we have not *dimorphism*, but *trimorphism;* there is a long-styled, a short-styled, and a mid-styled form, and each of these forms possesses two sets of stamens agreeing in position with the stigmas of the other two forms, and pollen grains that vary in size in proportion to the length of the stamens, and in colour also. These differences allow of eighteen methods of fertilization, but only six of these result in perfect fertility, as the small pollen grains only serve for fertilizing the short-styled flowers. None of the flowers can be fertilized by its own pollen.

The beautiful pink-spotted, green caterpillar of the Emperor-

1 *Pl.* 92. **Lady's Bedstraw.** (p. 105.) *I* 106.

Galium verum. RUBIACEÆ.



1 *Pl.* 93. **Purple Loosestrife.** (p. 105.) *I* 107.
Lythrum salicaria. LYTHRACEÆ.

moth may sometimes be found feeding upon Purple Loosestrife, though its more usual foods are heath and bramble.

There is another native species:—

The Hyssop-leaved Loosestrife (*L. hyssopifolia*). A smooth annual, with very narrow, lance-shaped leaves, chiefly alternate, and stems from 6 to 18 inches long, prostrate or half-erect. It has small, pink flowers, all of one form, appearing from June to September, in swampy places, chiefly in the Eastern counties, Cornwall, and the Channel Islands.

The name is from the Greek, *luthron*, gore, from the colour of the flowers.

Hedge Bedstraw (*Galium mollugo*).

The Hedge Bedstraw, from its size and habitat, is liable to be mistaken for Goosegrass, although a momentary handling of the two species would furnish a test of their distinctness.

Hedge Bedstraw (*Galium mollugo*) has long weak stems, 3 to 5 feet long, not so stiff and brittle as those of *G. aparine*, nor furnished with hooks, but smooth or hairy, the angles of the stem rough or hairy. The leaves are broader than those of *aparine*, variable in form and size, with bristles on their margins, and generally six to eight in a whorl. Flowers small, white, in large panicled horizontal cymes. The flowers will be found from June to August, and a favourite position for the plant is the upper part of a grassy hedgebank. The fruits are much smaller than those of Goosegrass, and are black and rough, but without the hooked bristles.

The typical form of the species is a trailer, but there is a sub-species (*G. erectum*) that assumes a more erect attitude, has more slender leaves, and the cyme has erect instead of spreading branches.

Sea Holly (*Eryngium maritimum*).

Almost without exception the British species of the order Umbelliferæ have flowers white or yellow; the solitary exception

is *Eryngium*, whose colour is pale blue. The plant would be a good one to test the thoroughness of a botanical student's methods. The superficial observer to whom a specimen is handed will probably declare it to be a Composite of the thistle section or a teasel. Our readers, however, may readily satisfy themselves that it is a genuine umbelliferous plant by separating the flower-cluster and examining the flowers. They will find that the foot-stalks of these flowers have been suppressed, so that they form dense heads with a conspicuous whorl of rigid and spiny bracts. Looked at more minutely, the calyx-tube will be found to be scaly, with sharp teeth longer than the petals ; the petals are narrow, and deeply notched, with a long point turned over towards the centre of the flower.

The stature of the plant is from 1 foot to 2 feet, rising from an extensively creeping perennial rootstock, which gives off rooting branches. The radical leaves are nearly round, from 2 to 5 inches across, with a tough, hard margin and spiny lobes ; those of the stem are more fully lobed in a palmate manner, but equally rigid and prickly, and the same character attaches to the bracts beneath the flower-heads. The whole plant is of that glaucous hue that is so common among our maritime plants. It flowers in July and August, and should be sought on sandy shores around our coast, where it is common. Other names by which it is known are Sea Eryngo, Sea Hulver, Sea Holm.

The only thing clear about the etymology of the word *Eryngium* is that it is a slightly altered form of the name used by Dioscorides, *eruggion;* but its significance is uncertain. Formerly the plant was of repute in medicine, and the roots were candied, and taken as a restorative and stimulant.

There is another species included in the British list, though it is apparently an alien. This is the Field Eryngo (*Eryngium campestre*), a plant of similar stature and appearance to the

1. *Pl.* 94. **Hedge Bedstraw.** (p. 107.) *I* 108.
Galium mollugo. RUBIACEÆ.

1 *Pl.* 95. **Sea Holly.** (p. 107.) *I* 109.

Eryngium maritimum. UMBELLIFERÆ.

Sea Holly, but of a paler, less glaucous green, more erect and more branched. The radical leaves are broken up into three or five leaflets, and those of the stem are cut in a bipinnate manner, presenting a closer resemblance to the thistle than to the holly. It is reputed to have been found wild in Kent and Suffolk ; also to be growing as an introduced species in Devon, Somerset, Northumberland, Waterford, and the Channel Islands.

Wild Carrot (*Daucus carota*).

The Wild Carrot is an Umbellifer, and is believed to be the plant from which the various kinds of Table Carrots have been evolved under cultivation. If the rambler will pull up a Wild Carrot by the roots he will see that the nucleus is there, though the difference between its dry stick of a root and the juicy, thick flesh of the Dutch Horn is enormous. From this root arises the tough, branched stem, which is ridged and grooved, and densely clothed with white hairs. The majority of the Umbellifers have the stems hollow—except at the joints—but in this species they are solid. The leaf-stalks are flattened out broadly and clasp the stem. The leaves are very much divided —technically they are *decompound*—the divisions being *pinnate* like ferns, and the undersides are hairy like the stems. The small white flowers are, of course, arranged in umbels, and some forty or fifty umbels are gathered together in a saucer-shaped head. Each petal is notched on its outer edge, and a portion turned over towards the ovary. The little bracts (*bracteoles*) of the small umbels are simple, lance-shaped, except the outer row, which have three of them branched. The bracts of the compound umbel are much broader, and deeply cut into about seven narrow segments. The fruits—an important element in the identification of all Umbellifers—are oblong and convex, each carpel with seven ridges, four of which are armed

with long, curved, distinct spines, and pierced with oil tubes (*vittæ*).

The flowers are conspicuous from May to August in hedges, the waste corners of fields, and on the roadside.

There is a sub-species, the Seaside Carrot (*D. gummifer*), with broader, thicker, and closer leaves, the flower-heads larger, hemispherical, and the spines of the fruit joined at their bases, instead of being distinct. It is by some considered a distinct species. It is found along the western coasts of England as far north as Cumberland; also in Ireland and the Channel Islands.

Daucus is the old Greek name for the plant, as used by Dioscorides.

Biting Stonecrop (*Sedum acre*).

Of the eight British species of *Sedum*, and the two or three additional kinds that have escaped from gardens and become locally naturalized, this is the best known. Chalk downs, rocks, and old walls are its favourite resorts, the stems growing downwards and curving outwards and upwards. The leaves are small, thick, produced into a kind of spur at the base, and closely pressing the older on the newer. The calyx is in one piece with five lobes, the corolla consists of five distinct golden yellow petals; stamens ten, with yellow anthers; carpels five, united at their bases. Flowers June and July. Another popular name for it is Wall Pepper, both names being due to the acrid taste. In the places where it grows freely it presents a fine sight when in flower, the large spreading patches being completely covered with the golden stars.

The other native species with yellow flowers are:—

I. Crooked Yellow Stonecrop (*S. reflexum*). This could not by any possibility be confounded with the Biting Stonecrop, for it has long, thick, awl-shaped leaves, ¾ inch long. These are swollen at the base, and disposed loosely up the stems in about six rows. These are much closer on the barren stems, and spread out or turn down to the stem. The flowering stems are 1 foot to 18 inches high, with several shallow curves, and ending in a cyme of bright yellow flowers; each nearly 1 inch across, and mostly with six petals. It flowers in July and August, and may be found on rocks, hedgebanks, old walls and roofs throughout the country, often merely an escape from the garden.

1 *Pl.* 96. **Wild Carrot.** (p. 109.) *I* 110.

Daucus carota. UMBELLIFERÆ.

1 *Pl.* 97. **Biting Stonecrop.** (p. 110.) *I* 111.

Sedum acre. CRASSULACEÆ.

II. St. Vincent's Rock Stonecrop (*S. rupestre*). Is very similar to *S. reflexum*, hut somewhat smaller, with shorter thickened and flattened leaves, arranged in five rows. Flowers golden yellow, $\frac{3}{8}$ inch in diameter. It is a rare plant, found only on rocky cliffs in South-west England and Wales, and in Ireland.

Of the species that come most closely to *S. acre* in form and habit, there are two :—

III. English Stonecrop (*S. anglicum*) forms matted tufts on rocks and turf-banks chiefly by the sea. Its habit is much like that of *S. acre*, but its thick little leaves are either glaucous or red, or a mixture of the two. It is at all times a pretty decoration of bare rocks and boulders, but especially from May to August, when its white (or pink) stars, with crimson carpels and purple anthers, are in profusion. On many Cornish headlands it may be found in company with Thrift and Vernal Squill, all flowering together and making a beautiful combination. The flowers of the English Stonecrop are about $\frac{1}{3}$ inch across, produced at the summit of the short stems.

IV. White Stonecrop (*S. album*) has prostrate barren stems, with bright green oblong leaves, narrowed at the base, and nearly $\frac{1}{2}$ inch long. The flowering stems are erect, nearly 1 foot high, and the white flowers are only about half the size of those of *S. anglicum;* July and August. It is believed to be indigenous on the Malvern Hills and in Somerset; but elsewhere it is considered a garden escape. Another small species that has escaped from cultivation and established itself in many places is the Thick-leaved Stonecrop (*S. dasyphyllum*), with hanging hair-like stems, and almost globular, glaucous leaves. Flowers white and pink; June and July.

V. Hairy Stonecrop (*S. villosum*) is distinct from all others found in this country, by reason of the glandular hairs with which it is covered. It is a biennial plant of boggy ground—a habitat that also separates it from its congeners. In its first year the short stem is invested by a tuft of slender half-cylindric leaves, but next year becomes as much as 6 inches long, with the leaves scattered up the stem. There are only five or six flowers in a cyme, and these are white, appearing in June and July. It is not found south of Yorks and Westmoreland.

VI. Orpine or Livelong (*Sedum telephium*). This and the next species are quite distinct from all the foregoing, their leaves being broad and—leaflike! Orpine has a stout perennial rootstock from which a number of stout annual stems arise, about 2 feet high. The leaves are broad, egg-shaped or oblong, mostly concave, with large blunt teeth. The rosy or pale purple flowers have five petals, etc., and are borne in a dense terminal cyme in July or August. It occurs on stony or sandy banks, but in the neighbourhood of houses it is often a garden escape.

VII. Rose-Root (*S. roseum*). Distinguished from the last named by—among other things—the root being scented with the odour of roses. The stems are usually shorter, clothed with alternate glaucous leaves of an ohlong or lance-shape. The smaller yellow or purple flowers have only four petals, and have stamens *or* pistils, not both. They appear from May to August; and the plant may be found on moist rocks in alpine and subalpine districts. It does not occur south of South Wales and Yorkshire. The petals are much smaller in the female flower, or altogether wanting

The name is from the Latin *sedeo*, to sit, from the peculiar habit of the plant.

Ivy (*Hedera helix*).

How common is Ivy, whether wild or cultivated! Yet how few are acquainted with its flowers!

There is no occasion to say that the Ivy is an evergreen perennial climbing shrub, nor to describe the form of the beautiful leathery leaf. If there is one leaf that may be said to be thoroughly well known to every British man, woman, and child, it must be the Ivy, for it thrives in dark corners of towns as well as on the hedgebanks of the country, and its foliage has been so well used in all classes of ornamental work. And yet there are few leaves that are subject to such great variation of form, though, with all its changes, one dominant character runs through them all, except its upper leaves, which are totally unlike. The Holly has prickly leaves for its lower branches, but those that are above the heads of browsing cattle have "entire" margins. So with the Ivy; its five-lobed leaves are for its trailing and climbing branches, but when it has reached the top of the wall or the tree it puts on simple lance-shaped leaves, and in September or October crowns these shoots with its umbels of yellow-green flowers, which are strong attractions to insects. Indeed, on a fine sunny day in late autumn the Ivy-blossom may be found giving refreshment to quite a motley assemblage of winged creatures—flies, beetles, bees, and butterflies.

The flower consists of a calyx with five triangular teeth, petals and stamens five each, style one, with five obscure stigmas. The flowers are succeeded by blackish berries, sometimes yellow. There is a common woodland variety, with smaller, narrower leaves, that never flowers; neither do those forms that persistently trail along the hedge bottom instead of climbing. In old woods and against ancient walls the Ivy may be considered as a tree, for though it does not stand alone, its trunk may be found nearly 1 foot in diameter. Ivy has been at

1 *Pl.* 98. **Ivy.** (p. 112.) *I* 112.

Hedera helix. ARALIACEÆ.

1 *Pl.* 99. **Woodruff.** (p. 113.) *K* 113.

Asperula odorata. RUBIACEÆ.

various times condemned as causing dampness in the walls it covers; the exact converse is the truth. It is the only British species; the genus contains but two for the whole world.

The flower-buds and berries are the favourite food of the caterpillar of the bright little Holly Blue butterfly.

Woodruff (*Asperula odorata*).

A good old-fashioned favourite among wild-flowers, better known indeed to our foremothers than to the present generation, it having been in request for giving a pleasant country odour to the clean linen neatly folded and put away in the linen-press. The great virtue of Woodruff consists in its giving forth this sweet savour not in life, but in death. As it grows in close patches in the wood or copse, it is a pretty enough object in its series of bright, shiny ruffs one above another, and its head of minute, ivory-white, funnel-shaped flowers surmounting all; but it is then only slightly odoriferous. It is when its juices are drying up, after the plant is gathered, that it yields the sweet odour of new-mown hay.

Woodruff has a thin rootstock that creeps underground among the light leaf-mould of its favourite habitat. Its slender stems are quite erect, and attain the height of a foot or a little more. The neat, smooth leaves are borne in regular whorls of seven, eight, or nine leaves, that give the name wood*ruff* to it. The flowers, which appear in May, and continue through June, are succeeded by tiny fruits that are covered with barbed bristles. The name of the genus is from the Latin *asper*, rough, in allusion to the hairiness of some species, though the present plant is perfectly smooth. It is especially plentiful in beech woods, where considerable patches of it may be found.

There is one other native species :—

The Squinancy-wort (*A. cynanchica*), a smaller plant, not odoriferous. It may be readily distinguished by the fact that there are but four leaves in each whorl or ruff, and of these two are smaller than the others. The leaves are stiff and the margins curled back, ending in a little point. The flowers are much smaller than those of *odorata*, and pinkish on the outside of the corolla. It occurs in drier situations, such as hedgebanks. June and July.

The genus is included in the Rubiaceæ, the natural order which also contains the Bedstraws (*Galium*), already described.

White Bryony (*Bryonia dioica*).

The important order of plants—Cucurbitaceæ—which includes the Cucumber, Melons, Gourds, and Squashes has but one solitary representative in Britain—the White Bryony. Even that is confined to England and the Channel Islands, and is rare in the North of England. In the south, however, it is common in woods and thickets. It has a thick, soft-fleshed root like that of the cultivated Parsnip, but larger and branched, the flesh white. From this in spring rise several shoots covered with silvery bristles, which rapidly grow into long, trailing, rough, angled stems that scramble over hedge or bush. They effect this by means of a number of tendrils that coil spirally, and support the weak stems. The stalked leaves measure 4 or 5 inches across, and are covered with rough hairs on each side. In general outline these leaves are heart-shaped, but they are cut up into from three to seven lobes, each deeply toothed. The flowers are of two kinds, borne by the same plant: (*a*) with stamens only, (*b*) with ovary and stigmas only; sometimes on separate plants, as the name *dioica* indicates. The calyx and corolla are the same in both, but the female flowers are at once distinguished by the globular ovary beneath the calyx. The calyx-tube is bell-shaped, with five teeth, and the corolla of similar shape, cut into five segments of a greenish white hue, marked by distinctly green veining, and hairy. The stamens are three, occasionally five. The slender style is divided into

1 *Pl.* 100. **White Bryony.** (p. 114.) *K* 114.

Bryonia dioica. CUCURBITACEÆ.

1 *Pl.* 101. **Common Fleabane.** (p. 115.) *K* 115.

Pulicaria dysenterica. COMPOSITÆ.

three stigmas, which are each cloven in two. The pistillate flowers develop into round berries, which become red when ripe, and contain from three to six seeds. It flowers from May to September, and the annual stems die down with the first frosts.

The name is from the Greek, *bruo*, to burst forth, in allusion to its rapid growth in spring.

The plate represents the upper portion of the male plant; the female flowers and the berries are shown below.

Common Fleabane (*Pulicaria dysenterica*).

One of the comforts arising from the possession of scientific names becomes evident when a person speaks of Fleabanes. Something like seven species of British plants are commonly designated Fleabane, whilst at least three others are Fleaworts. Which of these is intended can only be made plain if one is acquainted with the botanical names. One of these is the subject of the accompanying plate, a plant which was (perhaps we should say is) considered to be obnoxious to fleas, though they only sniffed the smoke from its burning leaves and stems. *Pulicaria dysenterica* is a common plant in marshy places, ditch-banks, and by the sides of rivers. It springs from a creeping perennial rootstock, and has branching leafy stems about 1 foot in height. The leaves are wrinkled and downy, oblong-heart-shaped with toothed edges, and the base partially embracing the woolly stem. The flower-heads are yellow, about 1 inch across, produced at the ends of the branches. The ray florets are developed into long slender straps (*ligules*), and contain no stamens, their material evidently having been used up in the production of the ligules. The involucre is woolly, its scales bristly. It may be found in flower from July to September. Formerly it was used as a medicine in cases of dysentery, a fact that is embalmed in the specific name.

It is our first example of the great natural order Compositæ,

or composite flowers, in which what is commonly regarded as a flower is really a vast assemblage of flowers closely packed upon a common *receptacle*. We have, therefore, used the term of flower-heads above. The structure of these flowers in a general way will be found set forth more fully on page 121.

The only other British representative of the genus is the Small Fleabane (*P. vulgaris*), a rare plant, in spite of the suggestion of commonness in its specific name, which refers, however, not to its occurrence in these islands, but to its general distribution throughout Europe, North Africa, and Asia. With us it must not be sought further north than a line drawn from Montgomery to Norfolk. It is a much smaller plant than *dysenterica*, and an annual. Its branching, downy stems are little more than ½ a foot in height, the leaves lance-shaped, slightly toothed. The yellow flower-heads do not exceed ½ an inch in diameter, with very short, erect ligules to the ray-florets. The involucre is downy instead of woolly; and that, as well as the other parts of the plant, is slightly glandular. It flowers during August and September, and should be sought for in moist, sandy places; but it is by no means a conspicuous plant.

The name is a derivative from the Latin, *pulex*, a flea.

Honeysuckle (*Lonicera periclymenum*).

The Woodbine or Common Honeysuckle is one of the most familiar of our wild flowers, and as great a favourite as any. It owes its popularity not only to the beauty of its flowers, but also to its strong sweet odour, and in some measure to its graceful twining habit. The tough stem grows to a great length—10 to 20 feet in some cases—and always twines from left to right. The egg-shaped leaves are attached in pairs, the lower ones by short stalks, but the upper ones are stalkless. The flowers are clustered, the five-toothed calyces closely crowded. The corolla-tube may be from 1 to 2 inches long, the free end divided into five lobes, which split irregularly into two opposite lips. It is rich in honey, the corolla being often half filled with it, and consequently it is a great favourite with bees and moths, who are bound to bring and fetch pollen from the outstanding anthers of one plant and deposit it upon the equally obtrusive stigma of another. The flowers are succeeded

1 *Pl.* 102. **Honeysuckle.** (p. 116.) *K* 116.

Lonicera periclymenum. CAPRIFOLIACEÆ.

1 *Pl.* 103. **Yarrow.** (p. 117.) *K* 117.

Achillea millefolium. COMPOSITÆ.

by a cluster of round crimson berries. It is widely distributed in hedges, copses, and on heaths.

The Honeysuckle, like its relations, the Elder and Wayfaring-tree, has no scaly wraps to protect its incipient leaves during the winter, and so it is among the very first to unfold their leaves early in the year—and sometimes they pay dearly for it, when a severe frost comes and turns them black and limp.

Perfoliate Honeysuckle (*L. caprifolium*) is similar to the last, but the upper pairs of leaves are joined together by their broad bases. The corolla-tubes are longer than in the common species, and it therefore becomes impossible for even the longest-tongued bees to carry off much of the honey. Moths with their long trunks can, and consequently they swarm upon it at night and carry the pollen from plant to plant. This species may be found in copses in Oxfordshire and Cambridgeshire, but is believed to be only naturalized—not a true native. Flowers May and June. The name Lonicera was bestowed by Linnæus, in honour of Adam Lonicer, a German botanist.

The genus is included in the Natural Order Caprifoliaceæ.

Yarrow or Milfoil (*Achillea millefolium*).

One of the commonest weeds in pastures, or on commons, roadside wastes, and often on lawns, is the Yarrow. Its leaves, as its second popular name indicates, are cut up into a large number of segments ; these are very slender and crowded, and are again cut up ; so that the general aspect of the leaf is exceedingly light and feathery. This is especially the case with the leaves (radical) that spring directly from the creeping root ; those given off by the flowering stem become more simple as they near the summit. Unlike as the flowers may at first sight appear to those of the Daisy and Dandelion, those of the Yarrow are also Composites. The yellowish disk-florets are tubular, and contain both anthers and stigmas ; the white or

pink ray-florets, of which there are only five or six, are pistillate only. Only a few florets are combined in one head, but a large number of heads are arranged in a corymb, which gives the entire inflorescence an appearance very different from that of most Composite plants. It abounds on all commons, pastures, and wastes, flowering from June till the end of the year. Yarrow is said to be a corruption of the Anglo-Saxon *gearwe*, and probably refers to the leaves being feathered like *ye arrow*. There is one other British species.

The Sneezewort (*A. ptarmica*), which is almost as widely distributed. Its flower-heads are much fewer than in Yarrow, and its leaves are more simple in character, the edges being merely cut into teeth. The disc-florets are more green than yellow, and the ray-florets vary in number from eight to twelve. It is about a month later than Yarrow in coming into flower, but thereafter the two species keep time together. The name *Achillea* was given to the genus, in honour of Achilles, who is reputed to have used Yarrow for the purpose of stanching his wounds.

Spur Valerian (*Kentranthus ruber*).

The noblest of our wall-plants. It is with regret we have to add that it is not truly wild in this country, but a visitor probably from Central Europe that has become naturalized on our old walls and occasionally in chalk-pits and railway cuttings, like its companions the Wallflower and the Greater Snapdragon. Its popular name has, obviously, been suggested by the superficial resemblance of its crimson flower-heads to those of the Cat's Valerian (see page 130). But we trust our readers are not to be deceived by superficial likenesses ; if so, let them glance at the leaves of each.

Spur Valerian has a woody perennial stem, from which many tough, smooth, round branches arise. The stalkless leaves are

1 *Pl.* 104. **Spur Valerian.** (p. 118.) *K* 118.

Kentranthus ruber. VALERIANACEÆ.

1 *Pl.* 105. **Marsh Cudweed.** (p. 119.) *K* 119.

Gnaphalium uliginosum. COMPOSITÆ.

lance-shaped, thick, of a grey-green hue, their broad bases sometimes with a few coarse teeth, but never cut up so as to have the smallest resemblance to those of *Valeriana*. The flower-head is bluntly conical, and the individual flowers are of very singular form. The calyx is a mere thickened margin to the ovary, but it unrolls and develops, after the fall of the corolla, into a feathery *pappus*. The corolla is very long ($\frac{1}{2}$ inch) and tubular, of the thickness of a stout pin, and ending in a hollow spur almost as long, but more slender. Held up to the light, this spur will be seen to contain honey; but, of course, it is only long-tongued insects that are able to reach it. There are five lobes to the corolla, but one stands out strangely away from the others. The pistil, with its very slightly enlarged stigma, protrudes $\frac{1}{6}$ inch beyond the corolla; and the solitary stamen, with its purplish anther, is almost as long. There is a faint sweet perfume from the flowers, and the root is also scented. The flowering time lasts from May to September; in sheltered places in Cornwall we have found it in flower at the end of March. Sometimes the corolla is white.

The name of the genus is Greek, and derived from *kentron*, a spur or goad, and *anthos*, a flower.

Marsh Cudweed (*Gnaphalium uliginosum*).

The Cudweeds are a neglected little genus of so-called everlasting flowers. There are but four British species, of which only two can be said to be fairly common. They are lowly herbs of an exceedingly woolly character, stem and leaves being alike covered with white hairs, whilst the scales of the involucre are of the peculiar character to which the term *scarious* is applied. They are stiff, dry, semi-transparent, retaining both form and colour for a very long period. They lack the beauty of *the* everlastings—*Acroclinium*, *Helichrysum*, and other exotic genera—for their flowers are small and unpretentious, the Jersey

Cudweed (*G. luteo-album*) being the only one having any claim to be considered beautiful.

I. Marsh Cudweed (*G. uliginosum*) is an annual, with a number of short branches (4 to 6 inches) rising from a prostrate stem. The leaves are narrow, simply stalked, cottony; those just below the flower-heads much narrower. The flowers are yellowish-brown, terminal on the branches. It is common in damp places on sandy heaths, and blooms from July to September.

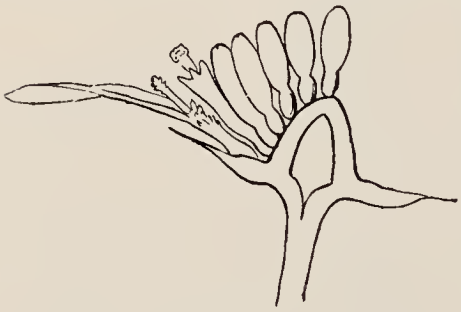
II. Jersey Cudweed (*C. luteo-album*) is also an annual, with many leafy stems, but of somewhat greater stature, varying from 6 to 12 inches. The leaves are long and narrow, with waved margins, and slightly embrace the stem (*half amplexicaul*). The flower-heads are pale yellow, in dense corymbs, conspicuous; and the scales of the involucre are glossy. It flowers in July and August, and occurs in light soils in Norfolk, Suffolk, and Sussex, but more frequently in the Channel Islands, whence its name.

III. Wood Cudweed (*G. sylvaticum*). Perennial, with a woody rootstock. Stem unbranched, nearly erect, 1 foot, downy. Leaves woolly beneath, not clasping stem. Flower-heads forming a long raceme, upper scales yellow or brown; lower cottony. Woods, thickets, and pastures. July to September. There is a sub-species (*G. norvegicum*) found in the counties of Perth, Forfar, and Aberdeen, with broader leaves woolly above and below, raceme short, and involucral bracts very dark.

IV. Dwarf Cudweed (*G. supinum*). Perennial, stem almost prostrate; flowering stems erect, forming low, woolly tufts. Leaves narrow, lance-shaped. Flower-heads small, brown, one, two, or three to each stem. Flowers July and August. Summit of the Highland mountains only, but there abundant; ascending to 2000 feet.

The name of the genus is from the Greek, *gnaphalon*, soft down.

The Natural Order *Compositæ*, to which *Gnaphalium* belongs, includes as many as forty-five British genera, which are divided into two series. Several of these genera will be illustrated and described in succeeding pages, but in all of them the flower-heads will be found to be constructed in a similar manner. Some will be found to have no ray-florets, others to be composed entirely of ray-florets; and all these modifications of the type give the distinctive characters to the



Portion of Daisy-head showing arrangement of florets.

various genera. Gnaphalium is by no means a good example of a Composite, for there is little distinction between the inner and outer florets.

The Daisy (described on page 125) is a better example, and in the accompanying figures these differences are more clearly shown. The yellow disk-florets will be seen to be tubular, with five lobes to the mouth, to indicate the five petals of which they are composed. These are packed closely side by side in the centre of the disk, whilst the head is made conspicuous by the

A Disk-floret.

A Ray-floret.

ray-florets, or outer ring, having two of these lobes enormously developed and coloured white. The disk-florets contain both stamens and pistil, but the ray-florets have pistils only. Various species of Composites should be cut through and compared with these figures to get a clear idea of their structure. We shall then find that the true calyx is reduced to a few hairs, which afterwards develop into part of the fluffy "clocks," which reach a large size in Dandelion and Goat's-beard. The apparent calyx is one or more rows of bracts below the flower-head, forming an involucre.

Mugwort (*Artemisia vulgaris*).

How much some plant-names convey; how little do others mean! There are not a few of the folk-names of our native flowers which have lost all meaning to the present generation. What can the present-day reader make of Baldmoney, Ale-hoof, Mat-felon, Mill-mountain, and many others? Mugwort, however, does convey a meaning still, though the use of the plant to give a bitter flavour to our drink may be quite obsolete. The allied Wormwood (*A. absinthium*) is still used for a similar purpose, as indeed is suggested in the name of *absinthe* given to the liqueur that has played such havoc on the Continent. We have four native species of Wormwood, as the *Artemisias* are generally termed, of which Mugwort (*A. vulgaris*) is the most widely distributed. It is a perennial aromatic herb, the red, rough stem from 2 to 4 feet high, shrubby at the base and branched above. The leaves are alternate, much cut into sharp-pointed segments, and silvery white beneath with silky down. As in the case of the other species, the leaves are arranged alternately on the stems; they are stalked, and the margins of the segments are turned back. The flower-heads are small, and are gathered into many short woolly spikes. They contain but a few tubular reddish-yellow flowers, which are wind-fertilized. The outer flowers contain no stamens, and the corolla has but three teeth. The inner ones have five teeth and contain only stamens, or stamens and pistil. It is a plant of waste-places, and flowers from June to September.

The other species are :—

I. Field Wormwood (*A. campestris*), 1 foot high, with nearly smooth leaves, silky when young; not aromatic. The few narrow segments have their edges turned back. Heads small, drooping, numerous, in long racemes. Florets yellow, only the outer series producing seed. Sandy heaths. Rare. Norfolk and Suffolk only. August and September.

II. Common Wormwood (*A. absinthium*). Stems 1 to 3 feet, with leaves silky on both sides, dotted; segments many, their edges flat. Flower-heads half-round,

1 *Pl.* 106. **Mugwort.** (p. 122.) *K* 122.

Artemisia vulgaris. COMPOSITÆ.

1 *Pl.* 107. **Field Scabious.** (p. 123.) *K* 123.

Scabiosa arvensis DIPSACACEÆ.

silky, drooping, in leafy racemes. Florets dingy yellow; outer only producing seed. Local. Wastes. August and September. Strongly aromatic.

III. Sea Wormwood (*A. maritima*), 1 to 1½ foot; leaves downy, segments flat. Heads narrow, in short spikes; florets reddish, all fertile. Seashores and salt marshes. Rare in Scotland. August and September.

The genus is named after *Artemis*, the Diana of the Greeks.

Field Scabious (*Scabiosa arvensis*).

Should any reader who has not previously made a study of botany, but who has followed us thus far, be asked to name the order to which the Scabious belongs, he would almost certainly say the Compositæ. He would be wrong, but almost right. Scabious is certainly a composite flower, though not one of the Compositæ; it is, instead, included in the order Dipsacaceæ. The anthers of Composites are all joined together by their edges to form a tube: in Dipsacaceæ they are free. Again, the calyx in Compositæ, we have seen, is reduced to a series of hairs (*pappus*), whilst in Dipsacaceæ there is a distinct tubular calyx invested in a separate *involucel* (or little involucre) of tiny bracts, quite independent of the common involucre that invests the whole head of florets.

I. The Field Scabious (*S. arvensis*) is a perennial with a stout rootstock and a hairy stem. The leaves vary considerably in different specimens, but usually those from the root are entire, of an oblong lance-shape, with toothed margins. The stem leaves are lobed, sometimes almost pinnate. The flower-heads are borne on a long stout stalk, and consist of about fifty florets, increasing in size from the centre to the outer margin, and of a pale blue or lilac colour, the central ones more inclined to red; anthers yellow. The corollas are usually four-lobed, those of the outer florets forming two lips. Involucral bracts broad and leaf-like, in two rows. Dry fields and downs June to September.

II. Devil's-bit Scabious (*S. succisa*). Rootstock short, coming to an abrupt conclusion, as though bitten off. Culpeper accounts for this and the name by saying: "This root was longer until the Devil (as the friars say) bit away the rest from spite, envying its usefulness to mankind; for sure he was not troubled with any disease for which it is proper." Leaves all entire. Involucral bracts lance-shaped, shorter than the corollas, in two or three rows. Flowers purplish-blue, sometimes white. Anthers reddish-brown. Florets nearly equal in size, four-lobed. July to October, in meadows and pastures, often covering large areas.

III. Small Scabious (*S. columbaria*). Rootstock thick and woody. Root leaves

entire, narrow; stem leaves deeply cut, almost pinnate. Involucral bracts longer than the corollas, in one row. Corollas five-lobed, the outer row considerably larger than the inner ones, and of irregular form. Anthers yellow, corollas purplish-blue. July to September, in pastures and wastes.

IV. Seaside Scabious (*S. maritima*) has been recorded as growing in Jersey, but is not a native. Its home is on the southern coasts of Europe.

The name is derived from the Latin, *scabies*, the itch, it being formerly used in curing this and other cutaneous disorders.

Corn Chamomile (*Anthemis arvensis*).

The Corn Chamomile is an annual plant exceedingly common in the fields of some localities, whilst in other districts it is as rare. The lower portion of its stem is prostrate, sending up erect branches with alternate, prettily cut leaves, twice pinnate. The flower-heads are borne singly on long stalks, and the floral envelope (*involucre*) consists of a number of overlapping scales (*bracts*), whose margins are dry and chaffy. The base (*receptacle*) upon which the florets are packed is convex and covered with little chaffy scales, which stand up between the florets. The yellow disc-florets contain both anthers and pistil; the white ray-florets are pistillate only. The whole plant is downy. It occurs in fields and waste places, flowering from May to August. Though somewhat widely distributed, it is a local plant. The name is an old Greek name for the Chamomile, from *anthemon*, a flower, probably owing to the profusion of its blossoms.

The other British species of the genus are two only :—

I. Stinking May-weed (*A. cotula*). Ray-florets usually without pistils. The plant is smooth or hairy, *not* downy, but the leaves are quite smooth, and covered with minute glands, which secrete a fœtid-smelling and acrid juice, causing swelling of the hands in persons clearing fields of this weed. Disk-florets yellow, ray-florets white. The flower-stalks are more slender than in *arvensis*, and the involucral bracts are narrower at their tips. Fields, wastes, and roadsides; very common in the South of England, rare in the north. Flowers June to September.

II. Chamomile (*A. nobilis*). Perennial. Branches spreading from the root along the ground, leafy and furrowed, hollow. Leaves downy, aromatic. Flower-stalk long and slender; involucre downy and chaffy. The white ray-florets are sometimes

1 *Pl.* 108. **Corn Chamomile.** (p. 124.) *K* 124.
Anthemis arvensis. COMPOSITÆ.

1 *Pl.* 109. **Daisy.** (p. 125.) *K* 125.

Bellis perennis. COMPOSITÆ.

wanting. Gravelly pastures and dry wastes in England and Ireland. Rare. It is not a native of Scotland. Flowers July to September. In great favour as a remedy for indigestion. Old authors are loud in their praise of the virtues of Chamomile, whether taken in the form of Chamomile tea or its mere odour inhaled as one walked over or lay upon a bed of it in the garden.

Daisy (*Bellis perennis*).

What need is there to figure and describe the Daisy? We confess that there is none, and yet we have done it deliberately, because no selection of representative British plants could be considered complete without it. Further, although everybody knows at sight this darling of poets and other children in all ages, yet there may be points of interest in the lowly flower that do not reveal themselves on a cursory inspection. We had almost written "simple" instead of "lowly" flower; but that would have been quite wrong, as it is a compound or Composite flower, which we have already explained amounts to a cluster of flowers. If the reader turns back to page 120 he will see a diagram representing part of a section through a Daisy. This shows a conical receptacle, and on this small platform there are crowded together about 250 small flowers (*florets*). These are of two very dissimilar forms: the central yellow, or disk-florets, are tubular, whilst those outside them are white and flat (ray-florets). The Daisy, then, must be regarded as a flower-community, and just as we find in human communities there is something like a division of functions.

The yellow disk-florets show, by the five lobes at the mouth of each, that their tubular corollas have been formed by the union of five petals. Within, we find that the anthers have also been united by their edges, forming a sheath within which lies the style with the two branches of its stigma pressed tightly together. The anthers come to maturity first, and when they shed their pollen it is all inside the sheath, and piled above the as yet closed and insensitive stigma-arms. The style lengthens

and pushes the pollen out at the mouth of the corolla, where it gets deposited on the legs and underparts of insects that crawl over the flower-head in quest of honey. The style elongates until the stigmatic arms are clear above the mouth of the corolla; then they separate, and are ready to receive pollen brought from other flowers or florets by the same insects.

The white strap-shaped ray-florets, if separated from the head, will be seen to resemble long tubes that have been split down one side and the material flattened out. You see the notch at the free end keeps up the original petal idea. (In some plants of this family there are two notches, making three petals, whilst the other two may be found, very small, one on each side near the base of the floret.) But much more material has gone to the making of a ray-floret than to a disk-floret, for the flower-community has evidently felt the need for advertisement. To make up for the extra expenditure of material upon these "banners on the outer walls," the plant has economized by fitting them with pistils only. There is another advantage besides economy in this arrangement, for when the ray-florets close up over the disc, as they invariably do at night and in wet weather, the stigmas are fertilized by being brought into contact with the pollen of the disc-florets.

The Daisy has a firm fleshy rootstock, several inches in length, from which the spoon-shaped leaves are produced in a rosette. The flower-scapes rise from the centre of this rosette to a height of from 2 to 5 inches, varying according to their surroundings. What has been said of the Furze in respect to its all-the-year blooming applies with equal truth to the Daisy, and we have seen sheltered fields in the south of England white with its blossoms on Christmas Day. This is the only British species of a small genus, which derives its name from the Latin *Bellus*, pretty. It may be found in all parts of the British Islands.

1 *Pl.* 110. **Scentless Mayweed.** (p. 127.) *K* 126.
Matricaria inodora. COMPOSITÆ.

1 *Pl.* III. **Beaked Parsley.** (p. 128.) *K* 127.

Anthriscus sylvestris. UMBELLIFERÆ.

Scentless Mayweed (*Matricaria inodora*).

Our illustration will seem to be that of a plant with which all are familiar; but it may not be the same, for there are several plants whose leaves and flowers, on a cursory glance, are alike, but to the botanist there are striking differences. We may take three Composite plants—this, the Chamomile, and the Stinking Mayweed—and at a slight distance they are alike, but a touch will assure the non-botanist of their difference. Scentless Mayweed gives no perceptible odour; the Chamomile exhales that sweet aromatic flavour identified with its name; whilst the Stinking Mayweed responds to the touch with a fœtid smell, and should our skin be very delicate, with a blister also.

The Scentless Mayweed (often called Corn Mayweed) is an annual or biennial, with many soft, green branches, well-clothed with alternate stalkless leaves. These look as though they had been designed for a submerged aquatic plant, they are so finely cut up into many exceedingly slender segments. Although these leaves appear a regular tangle on the plant, if one be plucked and the divisions spread out, it will be seen that there is a very distinct *pinnate* arrangement, and that the segments are themselves pinnate. The head of flowers is large, 2 inches across, supported by a long, smooth stalk; the ray-florets large, white, ultimately drooping, and the yellowish disk convex. The involucral bracts are edged with brown. It will be found in fields and hedges, flowering from June to October. Not aromatic. There is a var. *maritima*, found along our coasts, which differs from the type in being perennial, much more succulent, less erect, and with fewer flower-heads.

The only other British member of the genus is :—

The Wild Chamomile (*M. chamomilla*), which is very similar to the last. The flowers are smaller (¼ to ¾ inch), borne in a corymb; rays short, blunt; disk *conical*; involucral bracts *without* brown edges. The leaves, when touched, give off a sweet

odour similar to, but fainter than, the true Chamomile (*Anthemis nobilis*) (see page 124). Flowers from June to August in fields, etc.

The name is from the Latin, *matrix*, the womb, from its former repute as a remedy in uterine affections.

Beaked Parsley (*Anthriscus sylvestris*).

In May and June nearly every ditch and hedge-bank throughout the country is made beautiful by delicate umbels of tiny flowers and a profusion of wedge-shaped leaves of lace-like fineness and intricacy. Many a time have we had these leaves brought to us as fern-fronds, to be named. And they are so fern-like that the mistake would be excusable but for the presence of the abundant flowers and the fact that no hedgerow fern has fronds of such soft material, that begins to collapse the moment the leaves are separated from the plant. If this common weed were to become extinct, much of the beauty of our lanes in late spring would be gone also. The soft character of the leaves is shared by the flower-stalks, so that the flowers are not to be recommended as constituents of the wild nosegay; they begin to droop as soon as gathered.

Beaked Parsley is a biennial plant that grows to a height of 3 or 4 feet with a stout hollow stem that is hairy below but smooth above, and forrowed throughout. It terminates in the light cluster of umbels, which has no bracts at its base, though the simple umbels have several lance-shaped, fringed bracteoles, which are green, more or less tinged with pink, and either turned down or spread out. The small flowers are white, and the point of each petal is turned over towards the centre of the flower. The fruits, which are of the shape shown in the separate figure on Plate III., are about $\frac{1}{3}$ inch in length and smooth. The leaves are downy, wedge-shaped, twice or thrice pinnate, the leaflets being again cut pinnately and edged with large coarse teeth. It occurs in and around woods, as well as by the wayside.

1 *Pl.* 112. **Ploughman's Spikenard.** (p. 129.) *K* 128.

Inula conyza. COMPOSITÆ.

1 *Pl.* 113. **Great Valerian.** (p. 130.) *L* 129.

Valeriana officinalis. VALERIANACEÆ.

There is another species much like it :—

Common Beaked Parsley or Wild Chervil (*A. vulgaris*). Of similar dimensions and appearance, but with smooth stem throughout, and otherwise less hairy altogether than the preceding. The stem is swollen below the joints, and each compound umbel is opposite to a leaf. The flowers, though similar to those of *A. sylvestris*, are only half the size, and a similar observation may be made respecting the fruits. There is a further distinction in the roughness of the fruits, which are smooth in *A. sylvestris.* Though the two species may usually be found in flower at the same period, this is a little later in starting than the other.

A third species may sometimes be found in waste places near cottage gardens. This is the Sweet Chervil or Garden Chervil (*A. cerefolium*), a plant that was formerly much cultivated for salads and flavouring, and the plants we now find wild are the descendants of garden specimens. It is not a native plant, its home being in Eastern Europe, Western Asia, etc. Its distinguishing features are : similar to *A. vulgaris*, but stouter, with broader leaflets and larger flowers, the stem hairy above the joints, and the flowers are produced from the sides of the stem with a leaf at the base of the umbel. The smooth, slender fruits are $\frac{1}{3}$ inch long. Flowers from May to July.

The name is a diminutive of the Greek *antheros*, in allusion to the small flowers.

Ploughman's Spikenard (*Inula conyza*).

Spikenard is a very ancient name for a plant with fragrant roots. That mentioned in the Scriptures is believed to be *Nardostachys jatamansi.* As this had to be imported from India, it was expensive to buy, therefore ploughmen and other poor persons who wanted it for medicinal use had to be content with the costless substitute, *Inula conyza.* Hence the folk-name

for this common biennial, which grows in copses and on dry banks, its downy stem towering erectly for 3, 4, or 5 feet. Its large, oval-lance-shaped leaves are somewhat rough above. downy beneath ; the lower ones with footstalks, the upper ones almost stalkless. The numerous flower-heads are disposed in corymbs. They are yellow, but the ray florets are very slender and thread-like, and though they possess a ligule, it is so short as to be quite inconspicuous. The scales of the involucre are long and narrow, overlapping, the lower ones with their tips curved outward. It is another of those plants that are now known only to the botanists, because their lack of showiness leads to the flower being passed as that of "a mere weed." It flowers from July to September, but need not be sought north of York and Westmoreland.

Three other species of *Inula* are natives :—

I. Golden Samphire (*I. crithmoides*). A strong contrast between this and the last-mentioned. A perennial, maritime plant, growing on rocks and in salt marshes, with stout stem, but little branched, 1½ feet. The leaves are exceedingly narrow, fleshy, smooth, and yellow-green, without footstalks ; not toothed, but sometimes divided into two lobes at the top. Flower-heads 1 inch across, yellow, one ending each branch ; ligule short. July and August.

II. Willow-leaved Inula (*Inula salicina*). Peculiar to the shores of Lough Derg, in Galway, where it flowers in July and August. It is a perennial, 1 to 1½ feet, with stiff, narrow leaves, toothed and slightly hairy. The yellow flower-heads are solitary, 1½ inch across ; outer bracts of involucre leafy ; ligules slender.

III. Elecampane (*I. helenium*). Occurs truly wild, but in most cases the specimens found are to be considered as the descendants of cultivated plants in herb gardens. Perennial, 3 to 5 feet ; leaves large (radical as much as 1½ feet, saw-toothed, velvety beneath, oblong-lance-shaped, stalked) ; stem-leaves without stalks, heart-shaped. Heads of flowers 3 inches across, yellow ; involucre leafy. Meadows and copses. July and August. The root is candied and used as a stomachic and expectorant medicine. The name is that used by the Romans, and is said to be a corruption of *Helenion*, because the plant was fabled to have sprung from the tears of fair Helen of Troy.

Great Valerian (*Valeriana officinalis*).

The Great or Cat's Valerian will come under the notice of the rambler whose way lies by the stream-side, through wet

1 *Pl.* 114. **Hemp Agrimony.** (p. 132.) *L* 130.

Eupatorium cannabinum. COMPOSITÆ.

1 *Fl.* 115. **Ox-eye Daisy.** (p. 133.) *L* 131.

Chrysanthemum leucanthemum. COMPOSITÆ.

meadows or swampy woods. Where it is found it occurs in abundance, and its pretty flowers, massed together in great heads, will attract attention at once. It has a short, perennial rootstock, increasing by suckers, and narrow, pinnate leaves, those from the root soon withering. The stems are from 2 to 5 feet high, bearing the broad corymbs of pink, flesh-coloured, or white flowers. The calyx is five-parted, and the lobes are at first rolled inward, but as the fruit matures, these lobes expand and assume the form of a circlet of finely branched feathery hairs. The corolla is shortly tubular, with five lobes. The stamens are three in number, and the stigma is two-lobed. It flowers from June to August.

The roots have long been held in high esteem as a medicinal agent in certain nervous affections; and in some places the plant is known as All-heal, owing to its virtues. It has a warm, aromatic taste, but when drying, it develops a fœtid odour, which acts as a charm upon cats. If the reader would have cheerful nights, let him plant Valerian in his garden, and every cat in the neighbourhood will call to enjoy it. Strange to say, rats are equally delighted with its fragrance, and rat-catchers are said to use Valerian to assist them in attracting their victims. Query: Had the Pied Piper a root of Valerian in his poke?

In the typical form, sometimes known as var. *mikani*, the leaflets are notched on one side only, but in the var. *sambucifolia* they all toothed all round. This is the form depicted in plate 113.

There is one other native species, the Small Marsh Valerian (*V. dioica*), chiefly affecting boggy places. It has a creeping rootstock, and the root leaves are egg-shaped, with a long footstalk, whilst those of the stem are deeply lobed in pinnate fashion, with a large leaflet at the tip. The flowers, which are pink, are minute, and of four distinct kinds, which may be thus enumerated according to the size of the corolla. 1. Large, with anthers, but no pistil. 2. Small, with anthers and rudimentary pistil. 3. Smaller, with pistil and rudimentary anthers. 4. Smallest, with pistil, but no anthers. Flowers May and June.

A third species, the Heart-leaved Valerian (*V. pyrenaica*), may sometimes be encountered in plantations; though apparently wild, it is not a native, but an

introduction from France or Spain. It is similar to the Great Valerian, but of coarse habit, and the lower leaves are heart-shaped, deeply toothed, about a foot long. The stem-leaves have the basal part of the blade broken up into leaflets. It flowers in June and July.

The name is from the Latin *valere*, to be in health.

Allied to the Valerians is a small genus of inconspicuous-flowered plants, of which Lamb's Lettuce (*Valerianella olitoria*) may be taken as the type. They appear on hedgebanks early in spring, with smooth, pale-green, narrow, oblong leaves, of a soft and brittle texture like those of the Lettuce, and send up a stem perhaps a foot high, which forks several times, the branches ending each in a whorl of about eight purplish bracts, within which are about six little cymes of minute lilac flowers. The latter appear from April to June. The leaves are excellent salad material, and sufficiently tender to be enjoyed by young lambs—or *with* lamb, cold.

Hemp Agrimony (*Eupatorium cannabinum*).

This plant is rather fine when growing in a wood apart from other undergrowth, or on the banks of the river where it has room to show itself; but too often it is crowded up in a dense mass of hedgerow vegetation, each plant elbowing its neighbours and struggling up to the light. In such a position all character is lost, and we see little beyond the great masses of dull, purple flower-heads. It has much of the erect habit of the hemp (*Cannabis*), and the leaves provide a further resemblance. It is a perennial, with a woody base to its rounded, downy stems, which are branched only at the top. The opposite leaves are broken up into three or five lance-shaped, saw-toothed leaflets, which are from 2 to 4 inches long. The flower-heads are gathered into dense corymbs, which terminate the flowering branches. The involucral bracts are narrow, dry, and translucent.

I *Pl.* 116. **Teasel.** (p. 134.) *L* 132.

Dipsacus sylvestris. DIPSACACEÆ.

1 *Pl.* 117. **Coltsfoot.** (p. 136.) *L* 133.

Tussilago farfara. COMPOSITÆ.

The flower-heads may slightly puzzle the botanical tyro, for at first sight they do not appear to belong to the great Composite order. This is due to the fact that very few flowers are included in each head, that they are all tubular, none strap-shaped as in the ray-florets of the Daisy; and that the involucre is so much shorter than the florets. It is, in fact, the simplest of our composite flowers, each head consisting of five or six florets only, as shown in this figure. These, viewed individually, will be found to have the mouth of the tube cleft into five lobes, and to contain five anthers and a long, branched style, nearly twice the length of the floret. The flowers will be found from July to October, in the situations mentioned, provided the soil is damp. It is somewhat rare in Scotland, and is not found north of Sutherland; it is abundant in the South of England. It is a great favourite with butterflies, like the Painted Lady, Red Admiral, and Peacock, which, in places, swarm upon it to enjoy the plentiful honey.

A single head of Hemp Agrimony.

This is the only British representative of a genus containing about four hundred species, mostly American.

Eupatorium was the classical name for the plant, said to be so-called after Mithridates Eupator, King of Pontus, who discovered its medicinal virtues.

Ox-eye Daisy (*Chrysanthemum leucanthemum*).

We have already given several examples of Composite flowers, and an examination of the Ox-eye Daisy would quickly convince the reader that he has another Composite under

consideration. The popular eye noted long ago its similarity to a big daisy, and named it accordingly. In Scotland, too, where *the* Daisy is known as a "Gowan," the resemblance has been recorded by calling the Ox-eye a "Horse-gowan," and in the south the same suggestion of coarseness is made by terming it "Dog-daisy." If reference be made back to the Daisy (page 125), it will be seen that the involucre consists of a single series of green scales, whilst in the Ox-eye this part of the flower consists of three or four series of scales with thin, brown, or purple edges, overlapping each other after the manner of the tiles on a roof. The Ox-eye, too, it will be noted, has a distinct stem, the leaves of which differ from those produced directly from the rootstock, being narrower, deeply toothed, and stalkless. It is but too abundant in pastures and hayfields, which are effectively whitened by its flowers in May. It continues in flower till August where the plants are not cut down by the reapers. The name is from two Greek words, *Chrysos*, golden, and *anthemon*, flowers, from the golden disks of the flower-heads.

There are two other British species :—

I. Corn Marigold (*C. segetum*). A troublesome annual weed in cornfields, but as handsome as it is mischievous. The flower-heads are the same size as those of the Ox-eye (about 2 inches diameter). Its ray-florets are of a deep yellow hue, their tips not notched, but divided into two lobes by a central indentation. The involucral bracts are broad, with wide margins. Flowers June to September.

II. Feverfew (*C. parthenium*). Like the Ox-eye, this is a perennial plant with a much-branched, erect stem, broad, pinnate leaves, downy and aromatic. The flower-heads are small (½ to ¾ inch), and are clustered in many-headed, flat-topped bouquets (*corymbs*). The white rays are short and broad. Whole plant bitter and tonic. Waste places and hedgebanks. July to September. The Golden Feather of our gardens is popularly supposed to be a cultivated variety of this plant; but it is not. It is a distinct species (*C. præaltum*), which was introduced from the Caucasus so recently as 1840, and which is now establishing itself on rubbish heaps and similar places.

Teasel (*Dipsacus sylvestris*).

We have explained (page 123) in what respect the Scabious differs from the somewhat similar flowers of Compositæ, and

1 *Pl.* 118. **Chicory.** (p. 137.) *L* 134.

Cichorium intybus. COMPOSITÆ.

1 *Pl.* 119. **Long-rooted Cat's-ear.** (p. 138.) *L* 135.
Hypochæris radicata. COMPOSITÆ.

to a considerable extent that explanation will hold good for the genus *Dipsacus*, which is united to *Scabiosa* in the Natural Order Dipsacaceæ. There is this difference, however: in *Dipsacus* the flower-bracts end in long, straight, sharp points, and the involucel is four-angled. There are two British species :—

Wild Teasel (*D. sylvestris*). A striking object in copse or hedgerow, its stout, angular, and spiny stems rising to a height of 5 or 6 feet, and crowned by the prickly-cylindrical heads of flowers. These heads have an involucre consisting of from eight to twelve slender rigid bracts, spiny, longer than the flower-head, curved upward, and ending in a fine point. The corolla is purple, tubular, with four short, unequal lobes. It is a biennial plant, and only has radical leaves during its first year, sending up the flowering stem the second season. These radical leaves are stalked, lance-shaped, with a stout mid-rib, which is armed with short, strong, curved spines. They lie flat on the ground in a rosette about a foot and a half across, but can only be found during the plant's first year. When it begins to send up its tall stem, the radical leaves give up their substance towards the building of the stem. The stem-leaves are opposite, not stalked, the lower couples joined together by their bases, thus forming a large cup, in which rain and dew collect and drown many insects that attempt to ascend the tall stem, their dissolved remains being absorbed by the plant for its partial sustenance. It flowers in August and September. The Fuller's Teasel (*D. fullonum*), of so great importance to the cloth manufacturer, is believed to be a cultivated variety of *sylvestris*, having the involucral bracts shorter and spreading, and the scales of the flower-heads hooked.

Small Teasel (*D. pilosus*). This is a more slender plant, the stem not so tall or stout, and the prickles ending in soft hair-points. Leaves stalked, hairy. Flower-heads at first drooping, then erect; smaller, rounder, hairy, the involucral bracts shorter than the head. Flowers white. August and September, in moist hedges; not so generally distributed as *sylvestris*.

Coltsfoot (*Tussilago farfara*).

The Colt's-foot has seen better days, so far as human popularity is concerned. Time was when it had a wonderful reputation as a curer of coughs and healer of chest complaints. Its scientific name is based upon this reputation, for *Tussis*, a cough, is the Latin root from which *Tussilago* is derived. It is still used in a small way for such complaints, and we believe its leaves are an ingredient in the patent cigars sold for the cure of asthma and other bronchial affections. That by the way. Our concern just now is with the flower as such. It is one of those precocious flowers that hasten to break forth before the green leaves are ready. It is taken for granted that, early as the Colt's-foot blossoms, it does not do so until winter has gone, and that we may then look with confidence for milder weather. As a rule, this is so, but occasionally either Colt's-foot or the Clerk of the Weather makes a mistake. The plant is one of the Compositæ, and the flower-head is not unlike a large Daisy (1 to 1½ inch), that by some means has been changed to a bright yellow. Each one is borne singly on a tall, hollow scape, that is covered with long, woolly scales. Ofttimes a number of these scapes come up together, and so full is the clayey earth of its thick rootstock and its burrowing offshoots that the surface is thickly covered with the yellow flowers, which form a very grateful sight at that early date. The flower passes, the scape lengthens, and supports a hoary head of soft *pappus*, or down, to which the fruits are attached, and of which the goldfinch makes free use as a soft bed for her new nest. Next come the cobwebby leaves, of a broad heart-shape, the edges angled and toothed, and the undersides white with cottony down. These leaves all spring direct from the rootstock, and may become nearly a foot across. The flowers may be looked for any time after a cessation of frost, but usually

appear some time in March. What we have said about the resemblance of the flowers to yellow Daisies must not be taken as implying that there is anything more than a superficial likeness. The slender ray-florets are female, the disk-florets both male and female, and the style pushes up through the tube of stamens its club-shaped top; for the two stigmatic arms, described under Hemp Agrimony and other Composites, are here united, and cannot diverge.

There is no other British species, though Don professed years ago to have discovered the Alpine Colt's-foot (*T. alpina*) on the hills of Forfarshire; but, like other of Don's records, this has never been substantiated.

Chicory or Succory (*Cichorium intybus*).

The Wild Chicory is peculiarly a plant of the dry roadside, especially in chalk districts, where it is a striking feature. The rigid erectness of its grooved stems is not pleasing, but the bright, pale-blue flowers, attached to the tough stem or branch without the intervention of flower-stalks, arrest attention. Its thick, fleshy tap-root is the substance that, when roasted and ground, enters largely into the composition of "the finest French coffees, as sold in Paris," of our grocers. For this purpose it is cultivated on a large scale in Germany and Belgium.

If reference be made to the figure of the Dandelion on Plate 120, it will be seen that there is considerable resemblance between the leaves of the two. The radical leaves of Chicory spread themselves out, rosette fashion, upon the ground; the few that are scattered alternately up the somewhat hairy stem clasp the latter with the two lobes at their base. The flowers are usually in pairs. The involucre consists of two series of bracts, the outer row being shorter than the inner, and turned back. There is no distinction between ray-florets and disk-florets; they are all strap-shaped, and broad in proportion to

the ray-florets of other Composites we have described, with a straight end notched into five teeth. It flowers from July to October.

The generic name is from the old Greek word for the plant, and a similar name is in use in nearly all the languages of civilization. The popular name is of Arabic origin.

Long-rooted Cat's-ear (*Hypochæris radicata*).

Cat's-ear is one of those plants that are passed by the rambler as being "perplexing hawkweeds, which no one but a German botanist understands." It is not exactly a hawkweed, though it comes pretty close to that genus, and, roughly, may be said to resemble them, especially in colour. Of the Composite flowers included in this volume it will be seen that the Cat's-ear has a blossom similar in structure to that of the Chicory and the Dandelion (Plate 120). It has a perennial tap-root, from which arises and spreads a circlet of many rough, hairy leaves, their edges scalloped; there are no stem-leaves. The flower-stem is branched, each branch bearing but one flower-head, which is more than an inch across. The involucral bracts are in several series, laid one over the other like tiles. All the corollas are strap-shaped, with five teeth at the free end, yellow. The pappus or down that surrounds the fruit consists of a row of feathery hairs, surrounded by an outer row of shorter bristles. The flowers are longer than the involucre. It is plentiful in meadows throughout the country, and flowers from June to September. There are two other British species :—

I. Smooth Cat's-ear (*H. glabra*). An annual plant, found chiefly in dry fields on gravelly soil, but not nearly so commonly as *radicata*, for its heads are only half the size. Its leaves are broader, egg-shaped, and smooth. It has several branched flower-stems. The involucre is almost as long as the florets; the bracts are few and unequal. It flowers from June to September.

II. Spotted Cat's-ear (*H. maculata*). A rare perennial, confined to chalky and limestone pastures in several counties, *i.e.* the Lizard, Cornwall; Orme's Head,

1 *Pl.* 120. **Dandelion.** (p. 139.) *L* 138.

Taraxacum officinale. COMPOSITÆ.

1 *Pl.* 121. **Carline Thistle.** (p. 140.) *L* 139.

Carlina vulgaris. COMPOSITÆ.

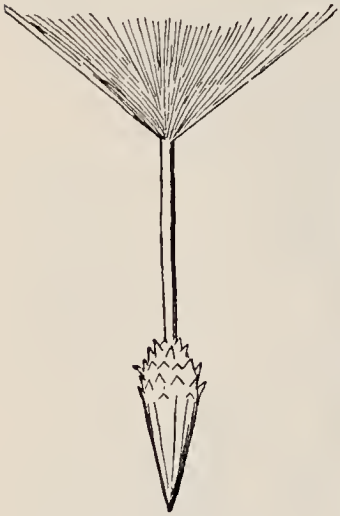
North Wales; Westmoreland, Cambridgeshire, Suffolk, Essex. Leaves rough with hairs, stalkless, egg-shaped, often with dark spots. Flower-stems seldom branched, usually with several small leaves and one large flower-head (sometimes several). 1 inch across. Involucre shorter than the florets; outer row of pappus absent. It flowers in July and August.

Dandelion (*Taraxacum officinale*).

Every one thinks he knows the Dandelion when he sees it, and probably he does; but often when he sees a Hawkbit he believes it to be a Dandelion. We may not like to find the Dandelion taking possession of our lawn, but we should regret to miss it from the odd corners by the fence and the roadside. It is a flower of three seasons, for it blooms continuously from March to October, and it is no unusual thing to see its golden flower in winter.

This is a Composite flower, like the Daisy and Cat's-ear, but whereas the Daisy head was seen to be made up of a host of tubular flowers, with a single outer row of strap-shaped ones, those of the Dandelion are all strap-shaped. It therefore stands as a representative of the second series of Composite genera—the Liguliflorae—which includes Chicory, Nipplewort, and Cat's-ear, as well as some others we shall consider in the Second Series of this work. By the way, all the genera of the Liguliflorae exude a milky juice if their stems or leaf-stalks are broken. The plant has no proper stem, the leaves springing directly from the long, thick root. From their midst arise the flower-heads on their hollow stalks. The floral envelope (*involucre*) consists of a double row of scales (*bracts*), the inner long, the outer shorter. The outer are turned back and clasp the stalk, the inner erect. Take off a single floret and examine with a lens. It will be seen that each is a perfect flower, containing both anthers and stigmas. The ovary is crowned by the corolla, which is invested by a *pappus* of soft, white, silky hairs, representing the calyx. Within the corolla the five anthers unite to

form a tube, in which is the style, which divides above into two arms—the stigmas. After fertilization the corollas wither, the inner bracts of the involucre closing over them while the fruits grow. Then the bracts open again, each pappus spreads into a parachute, and the whole of them constitute the fluffy ball by which children feign to tell the time. A light wind detaches them, and they float off to disperse the seeds far and wide. We have not figured this globe of down, as it is so well known, deeming it better to show the condition of the receptacle when nearly all the seeds have departed. We also give an enlarged figure of a single seed with its pappus, showing how well the barbed and pointed seed is adapted for sticking in the earth and remaining there.



Dandelion seed and pappus.

The name is believed to be derived from two Greek words, *Taraxos*, disorder, and *akos*, remedy, in allusion to its well-known medicinal qualities as an alterative.

Carline Thistle (*Carlina vulgaris*).

The short stature of the Carline Thistle probably accounts for the fact that, in spite of its general distribution, it is not one of the plants that the average man or woman can name at sight. And yet when once attention has been called to it in the places where it grows, it is not likely again to be overlooked. It is not a showy plant, but it is not without beauty of its own, which

1 *Pl.* 122. **Nipplewort.** (p. 142.) *L* 140.

Lapsana communis. COMPOSITÆ.

1 *Pl.* 123. **Blue Fleabane.** (p. 142.) *L* 141.

Erigeron acris. COMPOSITÆ.

must be sought mostly in the forms of leaves and flower-heads —and in both it is largely a matter of spines.

The Carline Thistle is a biennial plant of dry upland fields and sandy ground throughout the country, better known in its second year than in its first, as indeed is the case with many biennials. Its lance-shaped, spiny leaves then spread flat on the ground; they are 4 or 5 inches long, and the undersides will be found to be cottony. The second year a stout, tough stem arises to a height of about a foot, and branches several times when halfway up. Both stem and branches are well protected by very spiny leaves, which are sufficiently close together to make it difficult to get at the stem without scratches and punctures. These stem-leaves are shorter than the root-leaves, are stalkless, their bases half clasping the stem. These leaves and bracts occur right up to the prickly heads, which are still further protected by the involucral bracts being spiny. The innermost circle of these bracts are coloured yellow and spread out. The florets are all tubular and purple, but they are mixed with yellow bristles, that come up from the receptacle, so that the effect of the purple is reduced. The involucral bracts, however, serve the purpose of ray-florets in making the heads conspicuous.

The plant is in flower from July to October, but long afterwards, on dry days, the yellow bracts spread outwards and keep up the semblance of flowers. Even when the stems are cut, and the flower-heads are kept dry, they will retain their forms and appearance for years, and if placed where they are under the influence of the external atmosphere, they will act as hygrometers, the yellow bracts closing up over the florets when the air is moist, and expanding again when the air is dry.

The name of the genus is said to commemorate Charlemagne, who made use of its medicinal virtues by curing his army of the plague; it is further stated that he was directed in this matter by an angel.

Nipplewort (*Lapsana communis*).

Another common and widely distributed weed, whose portrait will strike all readers as that of a familiar plant, but of which most of them have never troubled to find the name. It grows everywhere on waste ground and the borders of cultivated fields, reaching a height of 2 or 3 feet, and becoming in July and onwards a great panicle of slender, yellow, flower-heads, that look like starved Cat's-ears. It is an annual plant, and its thin, lower leaves are comparatively large, of that shape which inventors of botanical terminology called lyrate, from an idea that in some distant fashion it resembled a lyre. There is a large terminal lobe, and a pair of narrow ones below it, the margins scalloped to produce distant teeth. The upper leaves are much smaller, lance-shaped, with their margins similarly toothed. The flower-heads are small, containing few florets, which are all yellow and of the strap-shaped kind. The involucre consists of a single whorl of bracts, which are slender and keeled. The bracts remain partially closed over the seeds (which have no pappus), the seed-head retaining an oval shape, which appears to have suggested the popular name of the plant. Dockorenes is another old English name of the plant, which was formerly eaten in salads. The genus, which is a very small one, has no other native representative; *Lapsana* is an old Latin name for it.

Blue Fleabane (*Erigeron acris*).

On chalk downs and other dry places, in July and August, may be found an unassuming little plant, with composite flowers little more than ½ inch across, whereof the disc is pale yellow and the rays pale purple. This is the Blue Fleabane, and according to its name the ray-florets at least should be blue; but their purple has more red than blue in it, and the pappus

1 *Pl.* 124. **Groundsel.** (p. 143.) *L* 142.

Senecio vulgaris. COMPOSITÆ.

1 *Pl.* 125. **Hard-heads.** (p. 144.) *L* 143.

Centaurea scabiosa. COMPOSITÆ.

that succeeds the flowers is distinctly reddish. This pappus is really more distinct than are the short ray-florets, which never spread out as in most composites, but retain an erect attitude. The plant is sometimes an annual and sometimes biennial, somewhat bristly, with branching stems about 1 foot high, but frequently only a few inches. The radical leaves are broad-lance-shaped, without either divisions or teeth. The stem-leaves are much narrower, and get more slender the higher up the stem and branches they are: they half clasp the stem. The involucral bracts are very slender, bristly, and in several series. There is only one other native species, but another from North America has got naturalized here: these are—

I. Alpine Fleabane (*E. alpinus*), found only on the Breadalbane and Clova ranges. A bristly perennial, with spreading, lance-shaped, radical leaves, and a few, narrow, oblong leaves on the flower-scapes, which do not exceed a height of 6 or 8 inches. Flower-heads from one to three only, about ¾ inch across; involucre covered with long, weak hairs; ray florets purple, ligule slender, disk-florets yellow. Pappus reddish. It flowers in July and August.

II. Canadian Fleabane (*E. canadensis*). An annual with much-branched hairy stems, 1 to 2 feet high. All the leaves are lance-shaped, broader near the ground, narrower near the flower-heads, some with a few teeth on the edges. The flower-heads are only ¼ inch across, the disk-florets pale yellow, and the inconspicuous ray-florets white, sometimes tinged with purple or red. The slender involucral bracts are green, with thin semitransparent margins. It flowers in August and September, and may be found on wastes and railway banks. The story goes that this plant was introduced to Europe by accident. A single seed was found among the material with which an American bird was stuffed. The seed was sown in a garden near Paris, and the resulting plant in turn produced a multitude of fluffy seeds, which were distributed in all directions by the four winds. With the energy characteristic of weeds imported into new countries, it rapidly spread all over Europe and to our own Islands.

The name of the genus was formerly given to the Groundsel; it is formed of the Greek words *eri*, early, and *geron*, an old man, from the aspect of premature age given to the flowers by the hoary pappus.

Groundsel (*Senecio vulgaris*).

We have selected this very vulgar plant as a familiar example of an important genus that contains some very striking species.

There are about 500 known species, of which, however, only nine are native to Britain, though two others have got a footing here. They all produce composite flowers, but in this common weed the ray-florets are usually wanting, and consequently the few cylindric flower-heads have a very singular appearance. The leaves are alternate, deeply cut, the lobes irregularly toothed. The flowers are succeeded by the well-known fluffy pappus attached to the seeds, which has enabled the plant to become one of the most widely distributed in all temperate and cold climates. It is to this hoary head of seed-bearers that the genus is indebted for its name, which is derived from the Latin *Senex*—an old man. It is one of the annual weeds that love to avail themselves of man's labour in loosening the soil for them; but as there is nothing woody about it, it never becomes a real nuisance to the cultivator. There are other eight British species, of which Ragwort is described later, and the most frequent of the others are briefly noted below.

I. Mountain Groundsel (*S. sylvaticus*). Leaves similar to *S. vulgaris*, but divisions more accentuated. When the ray is present it is rolled back. The flower-heads are more numerous than in *vulgaris*. Plant annual, with unpleasant, fœtid smell. Dry upland banks and pastures. July to September.

II. Stinking Groundsel (*S. viscosus*). More objectionable-smelling than the last. Leaves broader, more divided, glandular, hairy, and viscid. Plant annual, much-branched and spreading. Flowers larger, rays rolled back. Waste ground. Local. July and August.

III. Hoary Ragwort (*S. erucifolius*). Similar to Ragwort, but the stem more loosely cottony; the segments of the leaves more regular and less divided; rootstock creeping, perennial. Hedges and roadsides. July and August.

IV. Water Ragwort (*S. aquaticus*). Like *S. jacobæa*, but of lesser growth, with laxer and more spreading corymbs. Flower-heads larger, leaves less divided, leaf-stalks longer. Biennial. Wet places, riversides, ditches. July and August.

Hard-heads (*Centaurea scabiosa*).

The Centaureas are closely allied to the thistles, and share with them that hard-headedness which makes the thistle so good a type of the canny Scot. The Knapweed must be sought

in the company of the thistles on dry wastes and in neglected corners of pastures. Beginning to flower in July, it keeps up the display until September.

Knapweed is a composite flower, and it should afford interest to the reader, when he finds the blossoms, to institute a comparison between it and that of the Daisy or other of the Composites we have already described.

The grooved stem is but slightly branched, 2 or 3 feet high, and the long leaves are much cut up into egg-shaped segments. Nearer the summit of the stems the leaves are simpler, and reduced to a very slight width. The stems are covered with soft hairs. The globose flower-heads have for involucre a number of cottony scales, with dark-brown margins and pale fringe. The ray-florets are bright purple, their free ends divided into five long slender lobes. Other names for this attractive plant are Greater Knapweed and Matfellon.

There are five other British species of *Centaurea*, of which several are rare or extremely local in their distribution. The more frequent species are :—

I. Black Knapweed (*C. nigra*) Leaves rough, entire or lobed, the lower ones with stalks. The heads globose, 1½ inch in diameter. Involucral scales circular, brown, tootbed. Florets purple. Common in meadows and pastures. June to September. Much less conspicuous than *C. scabiosa*, and more weedy-looking.

II. Bluebottle or Cornflower (*C. cyanus*). Stem tbin, sligbtly branched. Lower leaves long, narrow, much cut up ; upper leaves slender, less divided. Stems and undersides of leaves covered with loose cottony fibres. Scales of involucre greenish witb toothed brown margins. Ray-florets five-toothed. bright blue ; inner florets darker. Stamens irritable, withdrawn into corolla-tube if touched. Cornfields, July and August.

III. Star-thistle (*C. calcitrapa*). A rare biennial, found only south of a line drawn from Norfolk to South Wales. It has a stiff stem about 2 feet high, much branched above and leafy. The leaves are cut in a pinnate manner, the distant lobes slender and ending in awned points. The flower-heads are less than ½ inch across, surrounded by a few large bracts, smooth and yellow, with spiny teeth along their edges, and ending in a long channelled spine. The florets are all tubular, and of a rosy-purple hue. It affects dry waste places, where it flowers from July to September.

The name of the genus is based on a story of mythology, that the Centaur Chiron used one of these plants for the stanching of his wounds.

Ragwort (*Senecio jacobæa*).

One would scarcely expect to find a very near relation of the vulgar, poverty-stricken Groundsel in the handsome, though too abundant, Ragwort.

Ragwort is a tall, erect perennial, with a stout, well-branched, leafy stem from 2 to 4 feet in height, crowned throughout the summer by rich corymbs of bright yellow flower-heads. Unlike the Groundsel, Ragwort is an absolute nuisance, though those not directly interested in agriculture can afford to admire the beauty of its flowering season, when acres of neglected land are painted with its rich gold. The general form of the leaf is that known as lyrate, but it is broken up by pinnate divisions into toothed lobes, to an extent that justifies its popular name—or we should say, one of its popular names, for it is also called St. James'-wort, Stagger-wort, and Stammer-wort—the last two names indicating that it was formerly regarded as medicinal for epilepsy and stammering. The upper leaves have no stalks, and their connection with the stem is marked by a pair of auricles. The flower-heads are about 1 inch across, the rays spreading, and the involucre is bell-shaped. It flowers from June to October; but in the extreme South of England it may be found in flower at Christmas. On most plants will be found the beautiful larva of the Cinnabar moth (*Euchelia jacobææ*), its body marked with alternate rings of black and orange. The Scots' name of Stinking Willie has reference to the unpleasant odour of the plant when bruised.

The other British species not mentioned under Groundsel have each undivided but toothed leaves; they are :—

I. Fen Flea-wort (*S. paludosus*), 3 to 6 feet. Rootstock short, stems leafy, erect, branched at top; leaves stalkless, cottony beneath, narrow lance-shaped, with coarse saw-teeth. Heads 1 inch across, rays numerous; in lax corymbs. June and July. Fens of Eastern counties; very rare.

II. Marsh Flea-wort (*S. palustris*), 2 to 3 feet. A biennial, with hollow, unbranched stems, downy; leaves stalkless, lance-shaped, with wavy teeth, the base half-clasping

1 *Pl.* 126. **Ragwort.** (p. 146.) *M* 146.

Senecio jacobæa. COMPOSITÆ.

1 *Pl.* 127. **Spear Plume Thistle.** (p. 147.) *M* 147.
Cnicus lanceolatus. COMPOSITÆ.

stem. Heads 1 inch or less across, with short rays, pale yellow, crowded in corymbs. Flowers June and July. Fens of Eastern counties; very rare.

III. Field Flea-wort (*S. campestris*), 4 to 12 inches; leaves all radical, stalked, leathery, oval, downy, the down covered with cottony hairs. Flower heads few on a scape, with long narrow bracts, pale yellow. May and June. Dry banks and chalk downs; local.

Spear Plume Thistle (*Cnicus lanceolatus*).

One needs not to travel far in search of the Spear Thistle; almost any pasture, every hedgeside, and every piece of waste ground will furnish as many specimens as we need. But it is not everywhere that we have a chance of seeing it to the greatest advantage. The pasture specimens are likely to be cut off before they flower, if the farmer is at all energetic, and the roadside examples are too frequently dusty and broken; sometimes, however, we may come in our rambles upon a bit of waste that seems to have been overlooked, hidden away between the boundaries of two landowners, a kind of "buffer-state." There we shall find the Spear Thistle, and some others of the tribe, in all their glory.

Cnicus lanceolatus is a sturdy giant of its race, the stout, erect stem being frequently 5 feet in height, with spiny wings down either side. The lance-shaped leaves vary in length from 6 inches to 1 foot, and are deeply cut into strongly toothed lobes, each lobe partly divided into two, and each division ending in a long sharp spine. They are bristly above and cottony beneath. The flower-heads terminate short branches, and hold themselves very erectly; the involucre is egg-shaped, cottony, 1 inch or more in diameter; its very numerous bracts are narrow, ending in long sharp spines. From the narrow end of this egg-shaped mass the long purple corolla-tubes break forth as a soft plume, to be succeeded by the silky down that buoys up the shining seeds in their autumnal dispersion far and wide. An examination of this Thistle-down in an unidentified plant will at once tell whether it belongs to this genus or to *Carduus*. In the

latter genus the pappus hairs are simple; in *Cnicus* they are feathered. It flowers from July to October, and is sometimes annual, sometimes biennial.

There are seven other members of the genus that trouble the British agriculturist, of which the most notable are :—

I. Woolly-headed Thistle (*C. eriophorus*). A stout biennial with furrowed stem, growing to a height of 4 or 5 feet, and large pinnate leaves, bristly above and cottony below. The divisions of the leaf all end in spines, and turn up and down alternately as though to guard both surfaces. The leaves do not send winged prolongations down the stem as do those of the preceding species. The heads are 2 or 3 inches in diameter, the involucre is globular and woolly, the numerous bracts having their edges fringed, and their terminal spines turned outwards. The florets are pale purple and the anthers blue. It flowers from July to September; but is of only local occurrence from Durham southwards to Kent and Somerset.

II. Dwarf Plume Thistle (*C. acaulis*), whose spreading leaves form so handsome a rosette in pastures, and whose stemless, solitary, crimson head looks so strange in the midst of the rosette. No closer description is needed. It flowers from July to September, and is especially plentiful on chalk downs.

III. Creeping Plume Thistle (*C. arvensis*). The too, too common perennial plague of the farmer, who often endeavours to suppress it by the vain method of decapitation, but its rootstock creeps extensively. Stems 2 to 4 feet, male and female flowers, on different plants, in separate patches; male involucres globular, female egg-shaped. Flowers dull purple, July to September. Leaves broad lance-shaped, pinnately cut into numerous spiny lobes.

IV. Marsh Plume Thistle (*C. palustris*). Biennial, 2 to 4 feet, stout, spiny. Leaves soft, hairy, continued far down the stem as spiny wings. Flowers dark purple; heads in leafy clusters; scales of involucre broad, keeled, purplish. Wet places. July to September. Generally distributed.

V. Meadow Plume Thistle (*C. pratensis*). A fibrous-rooted perennial with runners, whose leaves and stems are covered with cottony down. Most of the leaves are from the root, and are lance-shaped with wavy margins armed with small spines. These lower leaves have long stalks; those on the short, unbranched stem are stalkless, and half clasp the stem. The flower-heads are usually solitary—one to a plant—of fine form, the hemispheric involucre with its cottony bracts surmounted by the long and full brush of dark purple florets, which may be found from June to August. It must be regarded as a rare plant, and it does not occur north of a line drawn from North Wales to Yorkshire. Its habitat is wet meadows and boggy places. It is plentiful in parts of North Surrey.

VI. Melancholy Thistle (*C. heterophyllus*). There is some resemblance between the flowers of this and the last-named, but this has a tall branched stem that is much more than a flower-stalk. The perennial rootstock sends out runners like *C. pratensis*, and the lance-shaped leaves are white and cottony. The flower-heads are larger than in the last species, the involucre oval, and the florets red-purple; July to September. Mountain pastures and rivulets north of Derby, Staffordshire, and South Wales.

The name is from *Knekos*, the Greek for a Thistle.

FAMILY CHARACTERS OF BRITISH PLANTS

Described in this volume.

Buttercup Family (*Ranunculaceæ*).

The members of this family are mostly herbs, the only shrub among our native species being the Traveller's Joy (*Clematis*). Where the plants have stem-leaves they are alternate, except in the case of *Clematis*, where they are opposite. Where stipules are present they are attached to the leaf-stalk by the whole of one side. The flowers are mostly *regular* (that is, the petals are of equal size and shape), but in Larkspur (*Delphinium*) and Monkshood (*Aconitum*) they are irregular. Five and its multiples may be taken as the normal number of each kind of floral organ, but there are several departures from it. The sepals are always present, and in more than two-thirds of the genera they are coloured like petals, which in these genera are absent or reduced to tubular nectaries. Except in Mousetail (*Myosurus*) the stamens are numerous, and in technical language they are *hypogynous;* that is to say, they spring from below the ovary. The carpels, as a rule, are many, not connected, except in the Hellebores (*Helleborus*), and one-celled, developing into fruits of single-seeded *achenes*, or into *follicles*, containing many small seeds. In Baneberry (*Actæa*) alone the fruit is a many-seeded berry. Most of the species have acrid juices, which protect them from the attacks of browsing animals.

Illustrative genera : *Clematis* (p. 6), *Anemone* (p. 1), *Ranunculus* (pp. 3, 5, 13), *Caltha* (p. 12), *Helleborus* (p. 18), and *Aquilegia* (p. 31).

Barberry Family (*Berberidaceæ*).

Herbs or shrubs, our only native example being a shrub, with alternate leaves, and regular flowers. As in many of the Buttercups, the sepals are coloured like petals, but in this family the petals also are present. They are in multiples of two or three, and have two nectar-glands at the base of each. The stamens agree in number with the petals, and their anthers open by two little valves to discharge their pollen. There is a single one-celled carpel, with a broad stigma, developing into a berry containing one or two seeds. Out of a score of genera only one is represented in our flora (p. 15).

Water-lily Family (*Nymphæaceæ*).

All aquatic herbs, with stout fleshy rootstocks and floating leaves. Flowers solitary and regular, on a long scape. The floral organs all either spring from below the carpels (*Nymphæa*), or are attached to a fleshy disk in which the base of the carpels is also sunk (*Castalia*). The sepals vary in number from three to six, and the petals from three to an indefinite number. The stamens are also numerous, as are the carpels, which unite to form a many-celled ovary, on whose top the united stigmas form a rayed disk. The fruit is a berry that ripens above (*Nymphæa*), or under water (*Castalia*). The British genera are *Nymphæa* (p. 34) and *Castalia* (p. 34).

Poppy Family (*Papaveraceæ*).

Herbs with milky or coloured juice, and alternate leaves without stipules. The flowers are regular, and consist of two concave sepals, four petals, numerous stamens, and a one-celled ovary, the stigma forming a rayed disk. The sepals fall

on the opening of the bud, in which the petals lie crumpled, not folded as in most flowers ; petals and stamens also drop away when the flower has been open a short time. The stamens have slender filaments supporting the anthers, and are hypogynous ; the anthers open at their edges. Though the ovary is, strictly speaking, one-celled, it is practically divided into two or four cells by the ingrowth of partitions (*placentas*) from the walls, to which the seeds are attached. It develops into a capsule, the familiar Poppy-head, which opens by the contraction of small valves under the lobes of the stigma. Seeds small and very numerous.

Illustrative genera : *Papaver* (p. 47), *Chelidonium* (p. 11), and *Glaucium* (p. 47).

Fumitory Family (*Fumariaceæ*).

Herbs with watery juice, and (usually) divided leaves. Flowers irregular, borne in racemes. There are two small sepals, more like scales than floral organs, and these are cast off on the expansion of the flower. The four petals form two unequal pairs, one or both of the outer and larger swollen at the base or ending in a spur ; the inner and smaller are erect, and in the British species joined at their tips. There are six stamens, combined in two bundles, the central one of each bundle having a two-celled anther; the other anthers one-celled. The ovary is one-celled. There are only two native genera, which differ principally in the characters of the fruit. In Fumaria this is a single-seeded and globose nut, but in Corydalis it is a many-seeded capsule which opens by two valves. The British species of Fumaria also are all annuals ; those of Corydalis are perennials.

Illustrative genus : *Fumaria* (p. 7).

Crosswort Family (*Cruciferæ*).

A large family of herbs, rich both in genera and species, the British representatives being about eighty species in five and twenty genera. They have radical or alternate leaves, and the flowers in racemes. The distinctive character of the family is found in the flowers, which have four sepals and four petals, arranged in pairs at right angles, like the arms of the Maltese cross—hence the family names. The flowers are almost, but not quite, regular, for two of the sepals have a bulging at the base. The sepals stand erect with their edges touching, and so form a sort of tube which supports the slender and weak "claw" of the petals, whose "limbs" spread out from the top of the calyx. There are six stamens, attached below the ovary, of which one is placed in front of each bulging sepal, whilst the remaining four, which are taller, stand in pairs before the other sepals. There are also honey-glands on the disk before each sepal. The ovary is normally one-celled, but in most cases it becomes two-celled by the extension of the *placentas* or partitions to which the ovules are attached. The fruit is the well-known pod familiar to all in the seed vessels of the Wallflower, Cabbage, etc., which opens by two valves that drop off when the seeds are ripe. This pod takes various forms in different genera: in Honesty (*Lunaria*) it is almost circular; in Shepherd's Purse, heart-shaped; in Sea Rocket and Sea-Kale two-jointed and remaining closed. The family includes many of the most prolific weeds that trouble the cultivator, also most of our green foods.

Illustrative genera: *Cheiranthus* (p. 36), *Barbarea* (p. 8), *Arabis* (p. 9), *Cardamine* (p. 10), *Sisymbrium* (p. 19), *Erysimum* (p. 33), *Brassica* (p. 16), *Capsella* (pp. 21, 29), *Thlaspi* (p. 20), *Isatis* (p. 24).

Mignonette Family (*Resedaceæ*).

The British species are annual or biennial herbs, with alternate leaves. When stipules are present they are small and glandular. The flowers, which are borne in racemes, are irregular. The calyx is cut into from four to eight lobes, and the petals vary in number from four to eight. They are small, inconspicuous, and often much cut into lobes. The petals spring from beneath the ovary. There is a one-sided disk, with honey glands, to which the numerous stamens are attached. The ovary consists of several united carpels (two to six), open at the top between the lobes of the stigmas The fruit is a one-celled tough capsule open at the top, and containing many seeds.

Reseda (p. 26) is the only British genus.

Rock-rose Family (*Cistaceæ*).

Herbs or shrubs, with undivided, mostly opposite leaves, and small leaf-like stipules. There are five overlapping sepals, of which the outer two are small (sometimes absent altogether), twisted in the bud. Petals five, crumpled and twisted in the bud, but in the contrary direction to the sepals. In most cases the stamens are numerous, moving apart when touched. The ovary is one-celled, sometimes divided by partitions from its walls ; style simple with an enlarged head or divided into three stigma lobes. Fruit, a capsule, opening by three, five, or ten valves. Some species are dimorphic, certain of the flowers being without petals and having few stamens.

Helianthemum (p. 32) is the only British genus.

Violet Family (*Violaceæ*).

Herbs or shrubs (British species all low herbs), with radical or alternate leaves. Flowers mostly solitary, irregular. Sepals

five, overlapping in bud. Petals five, overlapping or twisted in the bud, the lower and largest spurred or enlarged at its base. The five stamens have short broad filaments, and are often united above the anthers, the two lower ones often with spurs which are honey-secreting glands. The ovary is one-celled, the style swelling above and ending in an enlarged or cup-shaped stigma. Fruit, a capsule, with three elastic valves. The flower-stalk curves so as to bring the lowest petal into the uppermost position.

Viola (pp. 44, 49) is the only British genus.

Milkwort Family (*Polygalaceæ*).

British species perennial herbs, with alternate undivided leaves, and irregular flowers. There are five sepals, of which the inner two are large and petal-like. There are three to five (usually three) petals, connected below, of which the lower is keel-shaped. The eight stamens are connected together and with the petals; the anthers opening by pores. Ovary two-celled, with a simple, curved style, and spoon-shaped stigma. The fruit is a compressed capsule which splits along the margins to discharge the solitary seed.

Polygala (p. 66) is the only British genus.

Pink Family (*Caryophyllaceæ*).

Herbs with rounded jointed stems, thickened at the junctions (*nodes*), and opposite, undivided leaves, usually with their bases joined. There are four or five free sepals, or there is a tubular calyx with as many lobes or teeth. There are four or five petals, mostly inserted below the ovary, occasionally around it (*perigynous*), which overlap, or are twisted, in the bud; they have a broad blade and a narrow claw. The stamens are usually

eight to ten, their anthers opening longitudinally. The ovary is one-celled, with two to five separate or connected styles, whose inner surface is the stigma. The fruit is a cylindric or globular capsule opening at the summit by three to ten valves, and containing many seeds.

Illustrative genera: *Dianthus* (p. 17), *Silene* (p. 29), *Lychnis* (pp. 22, 28), *Githago* (p. 52). *Cerastium* (p. 35), *Stellaria* (p. 23), *Spergula* (p. 39), and *Spergularia* (p. 27).

Tamarisk Family (*Tamaricaceæ*).

Shrubs or small trees, which have no native representative, though one species is extensively planted as a hedge and shelter bush along the South and East coasts. The overlapping leaves are so small and scale-like that the slender shoots appear leafless. The flowers are in spikes and consist of four or five separate sepals, and an equal number of petals, both kinds overlapping in the bud. The stamens vary from four to ten, and are inserted on the glandular disk. The anthers are of the kind termed *versatile*, which means that they are pivoted so lightly on the filament by a slight attachment at the back, that they swing freely, see-saw fashion. The ovary is one or more celled, with three or four styles. The fruit is a capsule opening by two to five valves. *Tamarix gallica* is described on p. 39.

St. John's Wort Family (*Hypericaceæ*).

Herbs, shrubs, or small trees (the native species, all herbs or shrubs), with opposite leaves, which are frequently studded with pellucid glands. The flowers are usually in terminal cymes, and consist of five (rarely four) sepals, overlapping in the bud; the same number of petals, inserted beneath the ovary, and

(usually) twisted in the bud; numerous stamens, gathered into bundles, and with versatile anthers. The ovary consists of three to five carpels, and may be as many-celled, or one-celled. The thread-like styles agree in number with the carpels, and have stigmatic tips. Though the fruit is occasionally a berry, it is mostly a capsule which splits through the centre of each partition (*septicidal*).

Hypericum is the only native genus, and is described on p. 49.

Mallow Family (*Malvaceæ*).

Herbs and shrubs in this country; in some parts of the world trees also. Leaves alternate, with temporary stipules. Calyx five-lobed, often with little bracts attached to the sepals, and forming an *epicalyx*. There are five petals, twisted in the bud. The stamens are very numerous, and their filaments are combined into a tube surrounding the ovary, and to which the petals are attached by their base; anthers one-celled, opening to discharge their pollen away from the stigmas. Carpels numerous, forming a ring. Fruits forming a ring. Exotic members of the family include the Cotton-plant (*Gossypium*).

Illustrative genus: *Malva* (p. 61).

Flax Family (*Linaceæ*).

Herbs, shrubs, or trees (British species all herbs), with undivided, alternate, or (rarely) opposite leaves, sometimes with stipules. Flowers in a cyme. Sepals four or five, separate or connected, overlapping in the bud. Petals four or five, inserted beneath the ovary, overlapping or twisted in the bud. Stamens four or five, alternating with an equal number of teeth (aborted stamens), or ten perfect ones, inserted in a ring below the ovary; anthers versatile. The ovary is three- to five-celled,

with a corresponding number of styles having the tips stigmatic. Fruit, a capsule, which splits septicidally (*see* St. John's Wort Family) into the separate carpels, which open by valves.

British genera : *Linum* (p. 55) and *Radiola* (p. 55).

Crane's-bill Family (*Geraniaceæ*).

Herbs, occasionally shrubby, with opposite or alternate leaves, and usually with stipules. Flowers regular, with five sepals, five petals overlapping in the bud, and ten stamens (in Stork's-bill five are aborted). The ovary is five-lobed and five-celled, ending in five styles which are united to form a tapering beak—the Crane's-bill, on which the family names are founded. The fruit splits septicidally to separate the five carpels (as in Crane's-bill), or down the middle of the back of each carpel (loculicidally) to free the seed, as in Wood Sorrel.

Illustrative genera: *Geranium* (p. 58), *Erodium* (p. 80), and *Oxalis* (p. 41).

Pea Family (*Leguminosæ*).

Mostly herbs, a few shrubs ; with alternate, usually divided leaves, and in most cases with stipules. As in several of the foregoing families, the following remarks have their application narrowed to the British species only ; they would require some modifications and extensions if applied to the family in its world-wide sense. The flowers are variously grouped in spikes, racemes, heads, or are borne singly. They are all irregular, and keep very close to one type of structure. They are also remarkably uniform in habits—the stamens always maturing before the pistils. The five united sepals often form two lips. The petals, as we have described on p. 38, are in two dissimilar pairs, and the odd one is enlarged so that it enwraps the others

in the bud, and when expanded is the most conspicuous part of the flower. There are ten stamens, whose filaments are united into a sheath which encircles the ovary; sometimes one stamen is distinct from the connected nine. The ovary is one-celled, ending in a curved style with simple stigma, and developing into a dry pod, or *legume*, which splits along its edges to liberate the single or double row of seeds. There are nearly three hundred genera throughout the world, with nearly five thousand species.

Illustrative genera: *Genista* (p. 46), *Ulex* (p. 37), *Cytisus* (p. 42), *Ononis* (p. 51), *Medicago* (p. 97), *Melilotus* (p. 40), *Trifolium* (pp. 64, 82), *Anthyllis* (p. 52), *Lotus* (p. 69), *Hippocrepis* (p. 76), *Onobrychis* (p. 71), *Vicia* (pp. 87, 96), and *Lathyrus* (pp. 53, 74).

Rose Family (*Rosaceæ*).

Herbs, shrubs, or trees, with alternate (occasionally opposite) leaves, with stipules. The flowers are always regular, the calyx five-lobed, the corolla of five petals, the blade mostly round, with a claw. The petals are inserted around the ovary, and whilst in the bud they overlap, as do the lobes of the calyx. The stamens as a rule are numerous, with small anthers. The carpels vary in number greatly, from one up to many, and they may be distinct, connected, or attached to the calyx-tube. The styles may be free or united, and have simple stigmas. The fruit varies greatly, as may be suggested by the names of plum, cherry, blackberry, strawberry, apple, rose-hip, haw, and medlar. The family is extensive and world-wide in its distribution.

Illustrative genera: *Spiræa* (p. 63), *Geum* (p. 60), *Fragaria* (p. 85), *Potentilla* (pp. 57, 70), *Agrimonia* (p. 81), *Poterium* (p. 94), *Rosa* (p. 67), *Pyrus* (p. 79), and *Rubus* (p. 91).

Saxifrage Family (*Saxifragaceæ*).

Herbs or shrubs, with opposite or alternate leaves. Stipules, if present, continuous with the expanded base of the leaf-stalk. Flowers in cymes, racemes, or solitary. The calyx is five- (or four-) lobed. There are five (occasionally four) petals, but these are absent in Golden Saxifrage. The stamens are equal to, or double, the number of petals, and are inserted round the ovary, which usually consists of two or more united carpels ; in Saxifrage two-celled, but in the other British genera one-celled. The many-seeded fruit may be a berry or a capsule.

Illustrative genera : *Saxifraga* (p. 98), *Chrysosplenium* (p. 75), and *Parnassia* (p. 72).

Stonecrop Family (*Crassulaceæ*).

Herbs or shrubs, mostly succulent, with opposite or alternate leaves, without stipules. The flowers are in cymes. The calyx is three- to five-parted, and the petals agree in number with the divisions of the calyx, but may be united or distinct. The stamens agree with, or are double, the number of the petals, one attached to the base of each petal, and the extra ones where present inserted between. There are from three to five carpels, usually distinct, but occasionally connected. The fruit is a cluster of three or more follicles. The family is represented in our pages by the typical genus *Sedum* (p. 110).

Sundew Family (*Droseraceæ*).

Perennial herbs, the British species with radical leaves only, forming a rosette, and covered with glandular hairs. Flowers in revolute cymes on a long scape. The sepals and petals vary from four to eight, and remain enclosing the fruit. The stamens

are four or more, inserted below or around the ovary. The fruit is a capsule opening by two to five valves, and containing many minute seeds, which have a loose chaffy coat. All the British species of the family are described on p. 102.

Mare's-tail Family (*Haloragaceæ*).

Aquatic herbs, with opposite or whorled leaves, and inconspicuous unisexual flowers. In Water Starwort (*Callitriche*) there is neither calyx nor corolla, and in Mare's-tail (*Hippuris*) no corolla. The calyx when present is superior, with two or four lobes. The petals vary from two to four, and the stamens from one to eight. Ovary inferior, mostly of two or four carpels; styles the same or half the number of the carpels. Fruit, two- to four-celled, or a cluster of one-seeded drupes.

Illustrative genera: *Hippuris* (p. 101) and *Myriophyllum* (p. 100).

Loosestrife Family (*Lythraceæ*).

Herbs or shrubs, usually with quadrangular stems, and opposite or whorled undivided leaves, without stipules. The persistent calyx is tubular or bell-shaped, inferior, and with three to six lobes, and as many alternating teeth. There are three to six petals, inserted in the calyx-tube. There are six to twelve stamens, inserted in the calyx-tube, with versatile anthers. The ovary is two- to six-celled, and the fruit is a capsule, enclosed in the calyx-tube.

Illustrative genus: *Lythrum* (p. 105). The Willow-herb Family (*Onagraceæ*) should have followed here, but its representation in text and plates has had to be deferred to the Second Series.

Cucumber Family (*Cucurbitaceæ*).

Prostrate or climbing herbs, with tendrils, alternate leaves, and no stipules. The unisexual flowers are in small cymes. The five-lobed calyx is superior. There are five petals inserted on the limb of the calyx. The male flowers have three stamens, and the females an inferior three-celled ovary, which becomes a many-seeded, one-celled berry. The White Bryony (*Bryonia dioica*), described on p. 114, is the only British representative.

Carrot Family (*Umbelliferæ*).

Herbs with jointed stems, the joints usually hollow except at their extremities. The usually much-divided leaves are alternate on the stems, the leaf stalk with dilated base. The small flowers are rendered conspicuous by association in umbels in which the long footstalks, or rays, converge below to a common point ; umbels often combined on the same plan into compound umbels The small umbels have an involucre consisting of a whorl of *bracteoles* at the base of the rays ; the compound umbels a whorl of larger bracts. All the flowers in an umbel are equal, and have both stamens and pistil ; or the outer ones will be larger with unequal petals and no pistil. The superior calyx has no limb, or it is represented by five teeth. There are five petals inserted on the ovary. The five stamens mature before the stigmas ; they have versatile anthers and incurved filaments. The ovary is two-celled, with two erect or curved stigmas. The fruit consists of two much compressed carpels, usually hanging from a slender axis (the *carpophore*). Each carpel has five or nine vertical ridges on its outer face, and between these in the substance of the walls (*pericarp*) are usually linear receptacles (*vittæ*) containing aromatic oil.

Illustrative genera : *Eryngium* (p. 107), *Sanicula* (p. 96),

Conium (p. 86), *Bupleurum* (p. 84), *Apium* (p. 95), *Pimpinella* (p. 93), *Conopodium* (p. 89), *Anthriscus* (p. 128), *Fœniculum* (p. 73), *Crithmum* (p. 68), *Œnanthe* (p. 90), *Æthusa* (p. 99), *Heracleum* (p. 77), and *Daucus* (p. 109).

Ivy Family (*Araliaceæ*).

Shrubs or trees: the only British species, a climbing shrub, with alternate, simple, or lobed leaves. The regular flowers are associated in umbels or heads. The superior calyx is represented by a ring of five teeth, attached to the ovary. The petals are five, and the stamens correspond in number, and alternate with them, or are twice as many (in some exotic species). The stamens are inserted beneath the margin of the disk. The ovary is two- to five-celled, with as many united stigmas. The fruit is a drupe or berry with one or more single-seeded cells. The Ivy (*Hedera helix*) is the sole British species (p. 112).

Honeysuckle Family (*Caprifoliaceæ*).

Shrubs or small trees (a few herbs), with opposite leaves, usually without stipules. Flowers in cymes. The three- to five-lobed or toothed calyx-limb superior. The corolla is five-lobed, sometimes two-lipped, and the four to ten stamens are inserted upon the tube; anthers versatile. The ovary is one- to six-celled, with a simple or lobed style. It develops into a drupe or a berry.

Illustrative genera: *Adoxa* (p. 101) and *Lonicera* (p. 116).

Bedstraw Family (*Rubiaceæ*).

Slender herbs (sometimes with a woody base), with square stems, and leaves forming whorls. They have all small flowers arranged in cymes on jointed footstalks. The calyx-limb where

present is reduced to a ring above the inferior ovary, or has from four to six teeth. The corolla has from three to five lobes, and is either bell-shaped, rotate, or funnel-shaped. The stamens agree in number with the corolla-lobes upon which they are inserted. The two-celled ovary supports two styles with terminal stigmas. The fruit is a dry or fleshy *pericarp*, consisting of two one-seeded carpels connected by their flat sides.

Illustrative genera: *Galium* (pp. 103, 107) and *Asperula* (p. 113).

Valerian Family (*Valerianaceæ*).

British species all herbs, with opposite leaves and no stipules. The flowers are small, and, as a rule, irregular, disposed in forking cymes. The superior calyx-limb is lobed, or consists of a feathery fringe which is at first rolled up and not apparent. The tubular corolla has from three to five unequal lobes. There are from one to five stamens, which are inserted at the base of the corolla-tube; the filaments slender, and so long that the versatile anthers are outside the mouth of the corolla. There is a three-celled ovary, but only one cell is provided with a seed-egg; the style is thread-like, and ends in a blunt or lobed stigma. The dry fruit is small, and does not open.

Illustrative genera: *Valeriana* (p. 130), *Kentranthus* (p. 118), and *Valerianella* (p. 132).

Teasel Family (*Dipsacaceæ*).

Perennial or biennial herbs, with opposite leaves and no stipules. The flowers are small (*florets*), crowded into a head protected in bud by an involucre of many bracts. The florets have each a smaller involucre (*involucel*) investing the calyx-tube. The limb of the calyx is superior and cup-shaped. The funnel-shaped or cylindric corolla is irregular, with four or five lobes, of

which the outer lobe is largest. There are four stamens inserted on the corolla-tube, with thread-like filaments, and versatile anthers projected beyond the mouth. The ovary is one-celled with a thread-like style. The one-seeded fruit remains invested by the involucel.

Illustrative genera : *Dipsacus* (p. 134) and *Scabiosa* (p. 123).

Daisy Family (*Compositæ*).

Herbs, with mostly alternate leaves, and no stipules. Flowers small (*florets*), crowded upon the dilated top (*receptacle*) of the flower-stalk, and enclosed in a general involucre of whorled bracts. The involucel of the Teasel family is here represented by scales or bristles standing up from the receptacle. The outer florets open first and the central ones last. Some florets are tubular and regular, four- to five-lobed ; others *ligulate* or strap-shaped, and irregular. If a flower-head consists entirely of tubular florets, it is said to be *discoid;* if the outer series, or the entire head, is of ligulate florets, the flower-head is *rayed.* The calyx-limb, if present, consists of hairs or scales. There are four or five stamens inserted on the corolla-tube, the anthers connected to form a tube. The one-celled ovary is surmounted by a style, whose upper portion usually splits into two arms. Fruit dry, one-seeded, often crowned by a buoyant *pappus* (as in Dandelion, Groundsel, etc.), which is a development of the calyx-limb.

Illustrative genera : *Eupatorium* (p. 132), *Erigeron* (p. 142), *Bellis* (p. 125), *Inula* (p. 129), *Pulicaria* (p. 115), *Gnaphalium* (p. 119), *Anthemis* (p. 124), *Achillea* (p. 117), *Matricaria* (p. 127), *Chrysanthemum* (p. 133), *Artemisia* (p. 122), *Tussilago* (p. 136), *Senecio* (pp. 143, 146), *Carlina* (p. 140), *Centaurea* (p. 144), *Cuicus* (p. 147), *Cichorium* (p. 137), *Lapsana* (p. 142), *Hypochæris* (p. 138), and *Taraxacum* (p. 139).

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